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TASMANIA

ea of Tasmania (including Islands and [illegible]) [illegible] sq. miles [illegible]
16,778,000 acres.

[illegible]—South of Australia, between parallels of lat. [illegible] and [illegible]
Latitude, and between 144° 30′ and 148° 30′ E. Longitude.

[illegible] by Abel Janszoon Tasman—Year 1642.

[illegible] Year 1803.

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TASMANIA.

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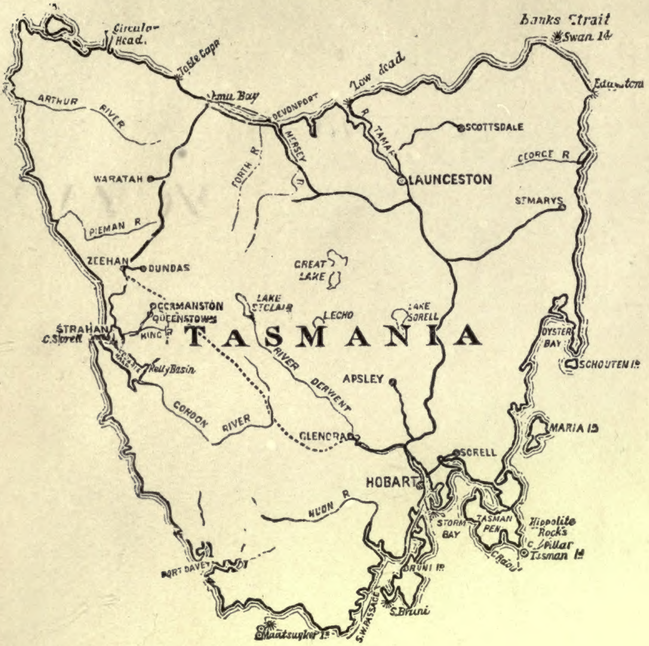

Area of Tasmania (including Islands and Lakes)—26,215 sq. miles, or 16,778,000 acres.

Position—South of Australia, between parallels of 40° 40′ and 43° 38′ S. Latitude, and between 144° 30′ and 148° 30′ E. Longitude.

Discovered by Abel Janszoon Tasman—Year 1642.

Taken Possession of as a British Colony—Year 1803.

First Settled—Year 1804.

Declared an Independent British Colony—Year 1825.

Representative Government Instituted—Year 1856.

Chief Products and Exports—Wool, Gold, Silver, Tin, Copper, Fruits, Timber, Bark, Grain of all kinds, Dairy Produce, Sheep (principally for Stud purposes), etc.

Population—180,000. Revenue—£1,100,000. Exports—£3,702,616.
Including amount collected and retained by the Commonwealth.

Imports—£2,651,754. Climate—Unsurpassed. Scenery—Unequalled.

Capital City—HOBART, situated in the South on the River Derwent. Population — With Suburbs, 34,000. Area — 1,270 acres. Harbour—Occupies first rank for extent of anchorage, situation, facilities for shipping, and beauty.

Federation of Australia—1st January, 1901.

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MR. H. G. GRAY
(of the Firm of Gray Bros.).

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THE EUCALYPTI
HARDWOOD TIMBERS
OF
TASMANIA,

AND

THE TASMANIAN
ORNAMENTAL AND SOFTWOOD TIMBERS.

A Descriptive Treatise on their Commercial Uses, with Reports on their Durability.

WE LEAD THE PLOUGH

Value 25 cts

Written and Compiled by D. W. Lewin.

PUBLISHED BY
GRAY BROTHERS,
HOBART AND ADVENTURE BAY,
TASMANIA,
1906.

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PREFACE.

THE chief object we have in presenting this publication to the Timber Trade throughout the World is not only to direct attention to the increasing value and importance of the Timber Industry of Tasmania, but also to afford useful general information, in a handy form, concerning our Timbers, and their Commercial uses, with Reports bearing on their Durability, for the advantage of intending buyers. We hope this handbook may achieve our purpose, and prove interesting, as well as the Photographic Views we have selected and inserted, which we have had taken at different times, with the aim of appropriately illumining the letterpress, and as a means of illustrating the methods under which Timber-getting is conducted in the Forests of Tasmania.

Shipping and Agency Work form part of our business, and Tonnage for Interstate or Foreign Freights consigned to us will be dealt with to the best advantage. Timber Export has been our study for many years, and we may fairly claim to rank second to none in this particular line.

We have supplied, under Contract, large orders for Blue Gum Piles, Sleepers, and Sawn Timber to eminent Contractors for the English Naval Authorities at Dover, Devonport, Malta, and Simon's Town, South Africa, which have given much satisfaction; also Blackwood to the English War Office, besides many other large Contracts in the various States of the Australian Commonwealth, New Zealand, and other countries throughout the World.

Our Firm is the Pioneer Exporter of Piles from this State to Great Britain, the Continent of Europe, and other Countries. We make a speciality of Piles, and having our own Forests, with the necessary working plant, also Steam Tugs, and specially built Lighters, for delivering Piles alongside vessels at Shipping Ports, we have exceptional facilities for supplying these in any quantity and length up to 120 feet, which enable us to offer them at the cheapest rates.

The standing and experience of our firm is a guarantee to buyers that only the best class of timber is shipped, and that a cargo is true to name, of uniform quality and cutting, fulfilling the requirements of specification and conditions under which the Timber has been purchased.

When desired, Timber supplied for Export may be inspected and branded by Experts appointed by Government, and an Official Certificate given as to quality and description.

GRAY BROTHERS.

Hobart,
1st November, 1906.

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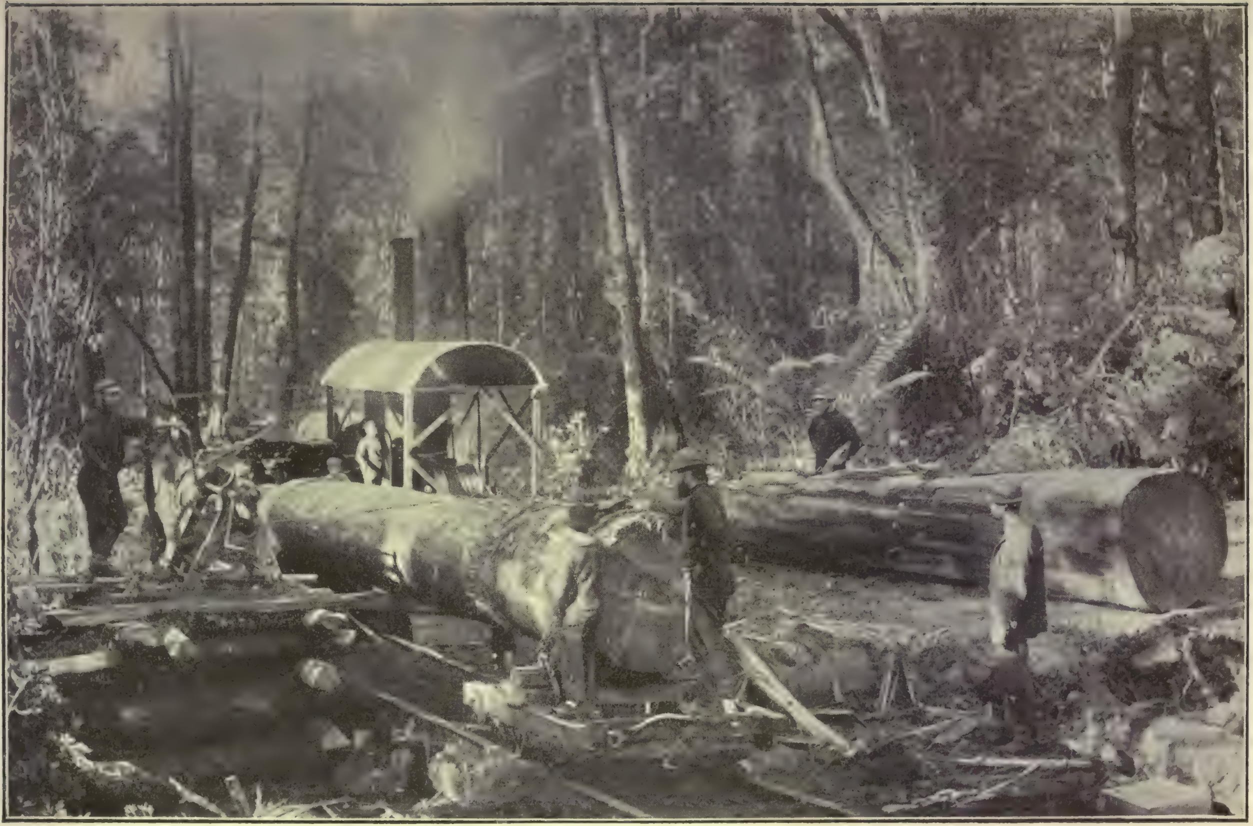
GRAY BROS. Loading Piles on Board Ship Flinders Bay, Southern Tasmania.

The Timber Industry & Forestry.

TASMANIA possesses, amongst other wonderful natural advantages, extensive Forests of valuable Hardwood, and for its area has the largest supply of timber available for export of all the Australian States. The entire land surface of the State is approximately 15½ million acres, about equal to that of Switzerland and Belgium taken together, of which the extent of country estimated to be under Forest is one-fourth, or about four million acres, consisting of some of the finest timber in the world, and probably in no other country of a similar area is to be found the variety of Forest Trees that exist in this Island State of the Australian Commonwealth. This State is largely covered with Forests having heavy timber of splendid quality growing in them, and within comparatively close proximity to deep water. There can be no doubt that in her Forests Tasmania has an immense source of wealth. Some of our trees are remarkable for their beauty, and many of them are of great botanical interest, while others have already been proved to be of considerable economic importance. Bush fires at times cause terrible havoc, and very serious loss and trouble to sawmillers, by the dryness of the country during the extreme heat of the summer season, and more often than not are caused through carelessness in burning-off by the settlers and others lighting fires which they thoughtlessly leave burning. A whole Forest of valuable timber may soon be destroyed in this way. In the past an enormous quantity of valuable Hardwood has been consumed by these fires, and also destroyed by the indiscriminating axe of the pioneer settlers ring-barking as settlement of the country advanced, owing to most of the rich fertile soil of Tasmania being heavily timbered with a good marketable product. Wisdom can surely find some reasonable means of preventing destruction of this kind in the future, although it is unlikely that a means will ever be found of absolutely preventing bush fires, but strict care can do a great deal with more stringent laws and severer penalties to put a stop to their frequent occurrence. The Sawmilling Industry is deserving of greater protection in this respect, as these fires very much hinder Sawmilling operations, and put Sawmillers to serious inconvenience at times by them. In the United States of America the Forestry Department has instituted special precautions to prevent the wholesale destruction of valuable timber belts by fire, and this example might well be followed by Tasmania and the other States of the Commonwealth.

The principal Hardwood Forests lie within a radius of 60 miles of Hobart, the Capital, in Southern Tasmania, where the greater quantity of better timber is to be found, although there are many extensive beds of fine timber in the North-Western and Western Districts of the Island. The port of Hobart is the distributing centre for the bulk of the Trade for the Local, Interstate, and Foreign Markets. This port is exceptionally well adapted for the loading and discharging of vessels, as it has a magnificent harbour, with deep water, and splendid wharves close up to the end of the streets. It is the deepest port in Australasia, and steamers loaded to a maximum draught of 33 feet can lie alongside at low tide, and should necessity arise, accommodation for any required additional draughts could be provided without the slightest difficulty. Hobart offers, and will offer, apparently for endless ages, deep-water berths unrivalled in the rest of Australasia.

Tasmania has special facilities for exporting timber. There are splendid Forests almost untouched, quite close to the water's edge, and the natural formation of the bays with the deep water makes it possible for vessels of large tonnage to load in perfect safety at the small outports, where most of the large Saw Mills engaged in the Export Trade are situated. The shipping facilities of Southern Tasmania are unexcelled for the transport of timber from its Coastal Forests, as these land-locked harbours and deep arms of the sea run so far inland as to reduce the cost of land carriage to a minimum, which, combined with improved log-hauling and the powerful economising machinery now in use at the Mills, enables

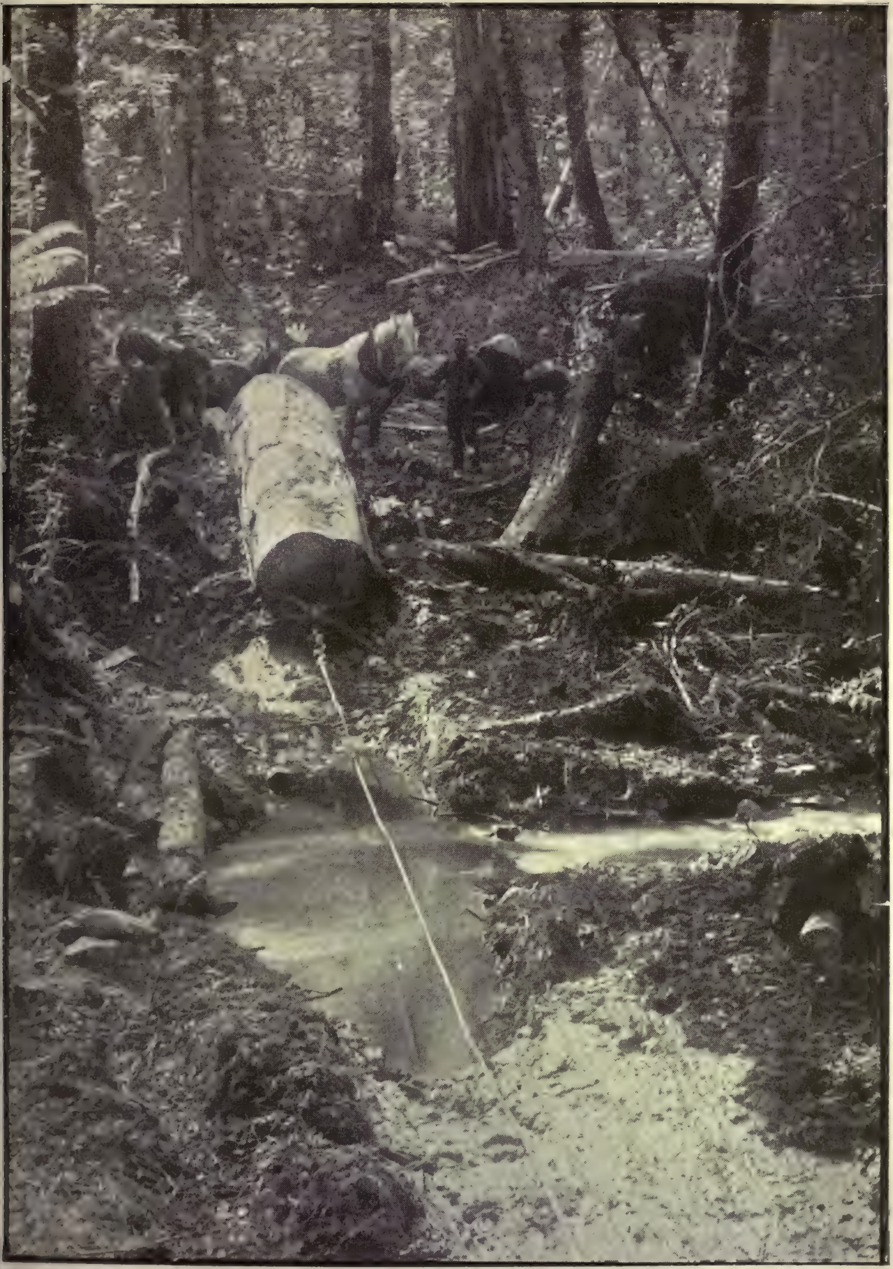


GRAY BROS.　Log-Hauler at Work. Loading Waggons at Bush Landing, Adventure Bay, Southern Tasmania.

us to be in the position to offer our Hardwoods at much cheaper prices than what the same class of timber can be placed in the Market by the other Australian States. It is, therefore, important for those interested in the trade to know that suitable Hardwoods of the very best quality procurable can be offered by us at the lowest prices on reasonable terms, which may bring them within reach of the Markets of the world, and render business possible and profitable. Great Britain is the largest timber-importing country in the world, and the most important Market for all other timber-producing countries in which to dispose of their produce. The value of the Foreign Timber Imports into the British Market alone amounts to about £25,000,000 annually, without taking into consideration the value of the Timber Imports of the European Continental ports. Of this vast sum the value of Exports to the United Kingdom and Foreign ports contributed by Tasmania is infinitesimally small, amounting to only £53,000 for the total Foreign Exports to all places during 1905. In bringing the qualities of our Hardwoods more fully before buyers, we are hopeful that our efforts may result in an improvement of this trade, and lead to business being done with the British and Foreign Markets and Tasmania on a more extended scale.

Timber-getting has been coeval with the settlement of the colony from its earliest days, Tasmania being the oldest of all the colonies to export its own timber. And what a contrast is afforded to-day in the method of timber-getting to that of the early days, when it was all cut by hand with pit and crosscut saws. In those early times as much as £5 a day was paid to men for quartering timber, in fact, a sufficient number of hands could not be got; whilst a saw was worth £2 and more. The first sawmill erected in Tasmania, which was worked by water-power, was that of Mr. Peter Degraves, at the "Cascades," near Hobart, in the "thirties." The late Mr. Joseph Risby (now the firm of Risby Bros.) at the end of the "fifties" was the first to start a steam sawmill in Tasmania, which was in Hobart. It is interesting to witness the present-day operations of felling and hauling the timber away back in the primeval forest, some of the trees brought down being over 300 feet high, and as much as 20 feet and over in diameter, to notice the wonderful effectiveness of modern mechanical contrivances and steam power in hauling out the great logs. There are now in use at the mills sets of steam saws which cut up enormous logs into flitches, and from flitches into boards or sleepers in about an hour or two. Instead of bullocks, Titanic steam bush haulers, with a steel wire rope, drag leviathan logs from around corners in the bush a quarter of a mile or more away on to landings to the trollies, which are fitted with powerful automatic brakes, standing on the tram lines, and they are then taken to the mill by locomotives or horse traction to be cut up and made ready for shipment to the various markets. The mills, which are fitted with all the latest improved machines, have their tram lines running into the extensive beds of forest, and are also connected by tramways with the jetties and wharves, where vessels can load alongside at any state of the tide. In Tasmania many of the milling plants are much more up-to-date than any that exist in most of the Australian States, as also are the facilities for oversea shipment. All these circumstances tend to the production of export timber at economical rates.

The scarcity of Hardwoods in some of the other States of the Commonwealth, and the consistent demands made upon their resources, are fast reducing supplies available within a reasonable distance from the shipping ports, and must tend to bring the Tasmanian product into greater prominence in the near future. Already there are indications that the available supplies of Hardwood Timber for large public works in different parts of the world are becoming less abundant, and experts predict that prices of Australian Hardwoods will be considerably higher in the near future. The demand for our timber has recently much increased, especially for Long Hewn Piles and Sleepers, and, if maintained, must result in higher prices ruling. In view of the forests of North America and Northern Europe being so greatly drawn upon, the supply from this source must soon show signs of exhaustion by their gradual deforestation. It is estimated a million acres of forest are cut down every year to supply European Railway Companies alone with the Sleepers on which the lines are laid. Only a few of the countries of Europe are able to grow timber enough to supply their



GRAY BROS.

Hauling Logs through Forest, Adventure Bay, Southern Tasmania.

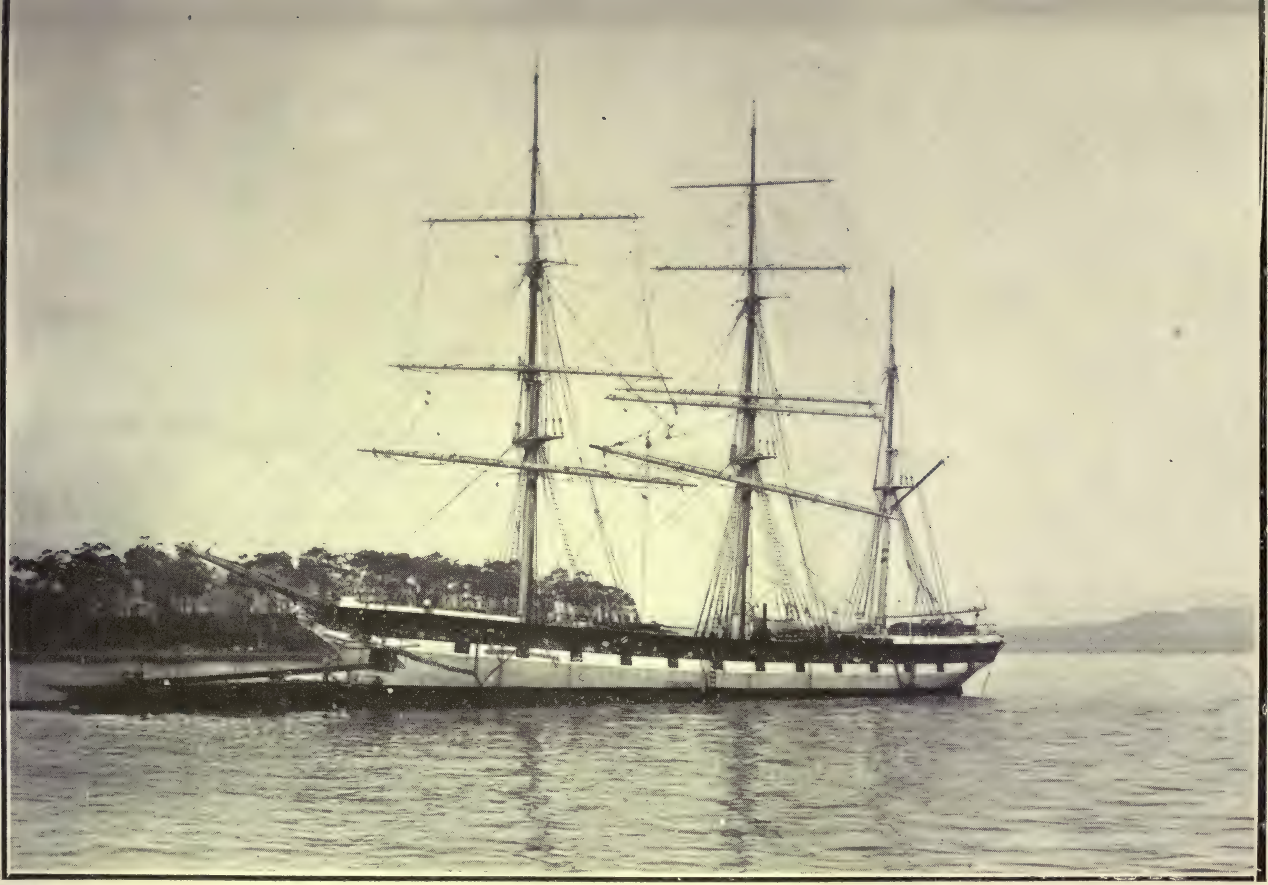
own requirements. According to Sir Herbert Maxwell, the growing scarcity of timber in many of the forest lands of the world is assuming alarming proportions. England annually imports £25,000,000 to £27,000,000 in value; France, from £4,000,000 to £5,000,000 worth. Although in Germany one quarter of the entire Empire is devoted to the cultivation of timber, and the forest service has reached the highest standard of perfection, the German Empire, he writes, now cannot supply her own wants, and notwithstanding her forests produce a gross annual value of £22,000,000 she has to import more than 4,500,000 tons of timber annually, valued at nearly £15,000,000. So in America. The amazing development of manufactures in the United States has overtaken the productiveness of their vast forests, so that 13 years ago the Secretary of Agriculture warned his Government that "even the White Pine resources, which a few "years ago seemed so great that to attempt an accurate "estimate of them was deemed too difficult an undertaking, have since then become reduced to such small "proportions that the end of the whole supply in both "Canada and the United States is now plainly in view."

Lumber in the North-Western parts, it is estimated, will become exhausted in about 15 years, and the present denudation of the forests is proceeding at such a rate as must tend to considerably lessen the export, and even soon seriously endanger the home supply. Of all the countries in Europe the United Kingdom is that with the smallest proportion of Woodland, there being only 1,665,741 acres under timber. Compare its meagre extent, 3.9 per cent. to the entire area, with Sweden's 44.4 per cent., with Russia's 36 per cent., Austria's 32.6 per cent., Germany's 25.8 per cent., France's 17.7 per cent., and the real poverty must be recognised. Even Greece, which presents such a treeless aspect to the ordinary tourist, possesses considerable forest resources, amounting to 15.8 per cent. of her area. Reckoning the Woodland area of each country in Europe in proportion to the population, the inferiority of the United Kingdom is still more apparent, for it can only show 0.07 acre per head of population against 25.77 acres per head in Finland, 0.66 acre per head in Germany, and 1.20 acre per head in Greece. The country of Europe most richly covered with forests is Russia, as it extends to about 530,000,000 acres, or more than 3½ times as great as the whole of the German Empire.

The chief Timber-exporting Countries of Europe are Austria-Hungary, Russia, Norway, Sweden, and Finland. The export of timber from Austria-Hungary amounts now to more than £10,000,000 worth annually, of which the greater part goes to Germany. Russia exports £7,000,000 annually, of which Great Britain takes about half, whilst a quarter goes to Germany, and the rest to France and Holland. Norway and Sweden export £8,000,000, and Finland £5,000,000 worth of timber. The revenue of the latter country derived from its forests brings in £400,000 per annum, and the bulk of its Timber Exports and raw material, such as Wood Pulp for the manufacture of Paper, goes to Great Britain. Since the greater portion of the earth is almost wholly destitute of trees, there is no denying the danger that in future it may be impossible to supply the multitudinous demands of modern civilisation. Sweden recently has become alarmed, and a bill has just been passed by the Riksdag limiting the purchase of extensive tracts of Forest Country.

Already Central Europe consumes all the Timber it can produce, and the surplus exported by Austria-Hungary is not sufficient to meet the demands of Germany alone. In some countries it has been found necessary to plant Forests to take the place of those that have been destroyed, and to preserve the young growing Timber. A reasonable Forest policy is adopted in every civilised country, as it not only preserves the supply of Timber, but encourages water conservation, soil production, and general improvement of the land. Timber is expensive now in most parts of the world. Forests are being cut out more rapidly than they are being replanted, and the price is rising in value in many countries.

At the present rate of consumption, and with the world's ever-increasing demand, the matured Timber Trees of this Island must in the course of time become scarcer, and our Hardwoods more expensive. As our trade expands, so will the Forests gradually disappear, unless in future years some means are taken by careful conservation to preserve and foster their reproduction by a prudent course of planting on systematic and scientific methods. This policy has been successfully carried out in India, Germany, America, and some of the other Timber-producing countries of the world. In Austria the most complete laws regulate its Forest management. In Germany the rule is never to destroy a tree in a Forest reservation without planting another. Forestry as understood on the Continent of Europe not only utilises and improves the Forest in the working, but so studies the natural Forest laws of reproduction and protection that the Forest itself, instead of being destroyed, is improved by cutting. At the present time 53,300 acres have been reserved by this State for Timber-planting and growing purposes, consequently the work of Forest Conservation is yet in its infancy; but our Department of Lands proposes to apply the principles of State Forestry in the future by reserving Timber areas from selection for the reproduction of natural Forests. This important question of replanting is already claiming more of our attention, and a further area of 95,000 acres is intended to be set aside as State Forests. The Timber lands which have been cut out near existing sawmills should be reserved, as the young saplings have already begun to grow, and in a few years there would be another Forest, perhaps better than the one already cut down. This would also be a saving of loss and expense to Sawmillers in having to shift their Mills afterwards, as the sites now occupied have been proved to be good shipping places, besides being well known. The waste of timber in past years by useless ring-barking, reckless cutting, and fires, with the lack of scientific afforestation, has been a countless loss to the State. Every timber tree felled or destroyed by fire represents the growth of decades, or even of generations, although it is estimated that our Hardwood Forests will reproduce trees to marketable dimensions for Sawmilling purposes in 20 years. As it is now, supplies in any large quantities of some of our best Woods are becoming difficult to obtain. More attention is being paid to our Timber resources by Capitalists from other parts, and our large Forests of Timber will eventually be made to become a greater source of wealth to our Island than at present. Forests conserve water and improve the soil. The destruction of the Forests means a failing of the watershed, and has a prejudicial influence on the climatic conditions of the country. They increase the humidity of the atmosphere in their vicinity, and the air is cooler in hot weather, owing to the amount of watery vapour over a forest being always greater than in the open country; and as the precipitation of rain is carried by the contact of vapour-laden air with a stratum of it already charged with moisture at a different temperature, it is only reasonable to assume that forests tend to increase the rainfall, as they certainly do the condensation of mist and fog. Hence the diminution of rainfall where a whole district has been cleared, and the frequent drying-up of creeks and springs, which follow the sweeping away of extensive bush areas. On the other hand, there are instances recorded of the converse effect of reafforestation, streams again becoming permanent, and springs more abundant. We should grow those trees that will produce the right kind of Timber that we want, but have now to import, which will yield the greatest return in the shortest time. Trees grown on a basaltic ridge give better Timber than those grown on low-lying plains. Tasmania is admirably situated for the growth and development of Soft-wooded Trees, such as Pine and deciduous Trees like English Oak, Ash, etc., as, for example, the fine English Oak Trees to be seen at Port Arthur, Tasman Peninsula. We import wood from other countries, principally Norway, Sweden, and America, amounting to one-third of our own export of Timber, and paying at least two-thirds more for it than if it were grown on our own soil. As Mr. W. Heyn, of the Timber Department, Admiralty Contract Works, Dover (E.), stated in a paper read before the Royal Society of Tasmania, at Hobart, 12th May, 1902, this Timber could be grown better on our own waste lands, within a few miles of our principal ports, at a mere nominal expenditure relatively to what it costs us now to import, at a saving of 60 to 70 per cent., with the triple advantage of having sufficient for our home consumption, and a large quantity for exportation to the neighbouring States, and last, but not least, at the same time ameliorating the hygiene of our Island by plantations which would collect the rain, of which we have in some districts so much need. At the Canadian Forestry



GRAY BROS. Shipping Blue Gum Piles at Norfolk Bay, Southern Tasmania, for Admiralty Works, South Africa.

Convention held recently, Earl Grey, the Governor-General, when speaking of the vanishing Forests of the World, stated that he had seen in India, Asia-Minor, Greece, and Italy, extensive tracts of territory, once inhabited by a strenuous, prosperous, and numerous population, reduced to the misery of barren desolation by the unregulated deforestation of lands by a blind and selfish generation, with no regard for posterity or anything but their own requirements.

> " The noble forests of our land
> " Beneath man's devastating hand
> " Soon will have vanished, leaving there
> " This country lying gaunt and bare."

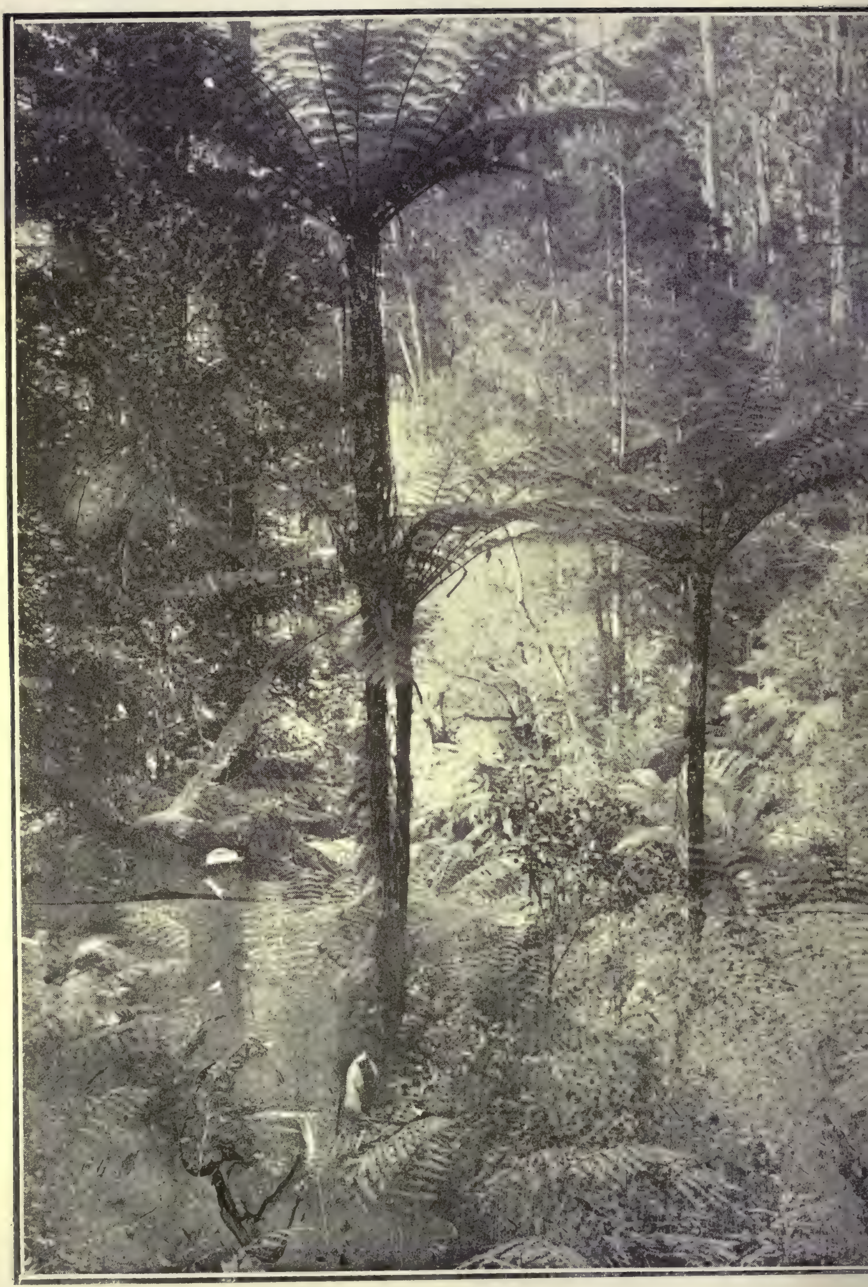
The late Baron von Müeller, the eminent Australian Naturalist, beautifully expressed his opinion on the subject as follows :—" I regard the forest as an heritage " given to us by nature, not to spoil or to devastate, but " to be wisely used, reverently honoured, and carefully " maintained. I regard the Forests as a gift entrusted " to us for transient care during a short space of time, " to be surrendered to posterity again as an unimpaired " property, with increased riches and augmented blessings, to pass as a sacred patrimony from generation to " generation."

Few people, perhaps, realise what a valuable asset our Forest Lands are. A tree once cut down can only be replaced after long years of waiting, and the Timber Industry is worthy of preservation for all time, and it is our urgent duty to maintain an adequate supply of Timber, to protect existing Forests, and to renew old ones. Of all Tasmanian Trees, Gum Trees are the most remarkable, from the immense size to which they attain, and the wide range of uses to which their produce may be put. There are few countries for its size better endowed by nature with Forest than Tasmania, and many parts of the world are now supplied with Hardwood from the magnificent trees which once stood in Tasmanian Forests. Indeed, so far as height and general beauty are concerned, the Tasmanian Oak and Blue Gum Trees are no mean rivals to the famous Redwoods of California. As one writer has said—" London omnibuses run on pave- " ment blocks of Tasmanian Timber, South African " trains travel over her Sleepers, her Mines are propped

" up with Tasmanian Wood, while in New Zealand and
" many other countries Wharves are laid down on her
" Piles. The use of her Blackwood ranges from the
" exalted Bench of the Supreme Court to the humble
" stave of the colonial beer barrel, and from the body of
" a grand piano to the highly polished furniture of an
" Alcock Billiard Table."

The enormous growth and rich beds of Timber within a comparatively easy access to shipping along the D'Entrecasteaux Channel, a short distance south of Hobart, are probably unrivalled in any other part of the world. While the demand for our Soft Woods is great, and still growing, and the supply is fast decreasing, our South Eastern Forest alone is quite capable of supplying for several generations all demand for Hardwoods, extending, as it does, from south of Recherche north to the junction of the Huon and Arve Rivers, a distance of about 60 miles, with an average width of about six miles. This vast Forest will average 90,000 feet per acre, including a few small plains that are met with. Some of the heaviest parts have been carefully estimated, and found to contain as much as 250,000 feet to the acre. These extensive Forest beds of timber include the finest Blue Gum, Tasmanian Oak, White Gum, Peppermint, Gum-topped Stringy Bark, Myrtle, Blackwood, and other varieties. What is principally worked by the Mills is Blue Gum and Tasmanian Oak. In some parts this is the roughest timber-getting country in Australia, probably in the world ; but the material is also of the best, and the Forest operations require expert knowledge and skilled experience for the work of getting the timber out.

We have endeavoured here to give a short outline to show the great importance and extent of the Forests and Timber Industry of Southern Tasmania, and we need not enlarge further on the benefits to be derived from the possession of suitable forests. The Trade is one that is bound to expand as time goes on, as the supplies are running shorter in various parts of the world, whilst in Tasmania, especially with an introduced system of afforestation, our Forests, with proper care, may be made to last for centuries, and that, too, of some of the finest timber in the world. With the world's constant increase of



GRAY BROS. Forest Scenery, Southern Tasmania.

population, and progress in Arts and Manufactures, and especially now that timber can be converted into paper, and no end of other new uses, the demand for it to-day, according to Mulhall's and other statistics, exceeds the production, which has brought about in some countries very successful scientific policies, which example Tasmania may have to follow some day, although our supply will last for several generations, even with increased export.

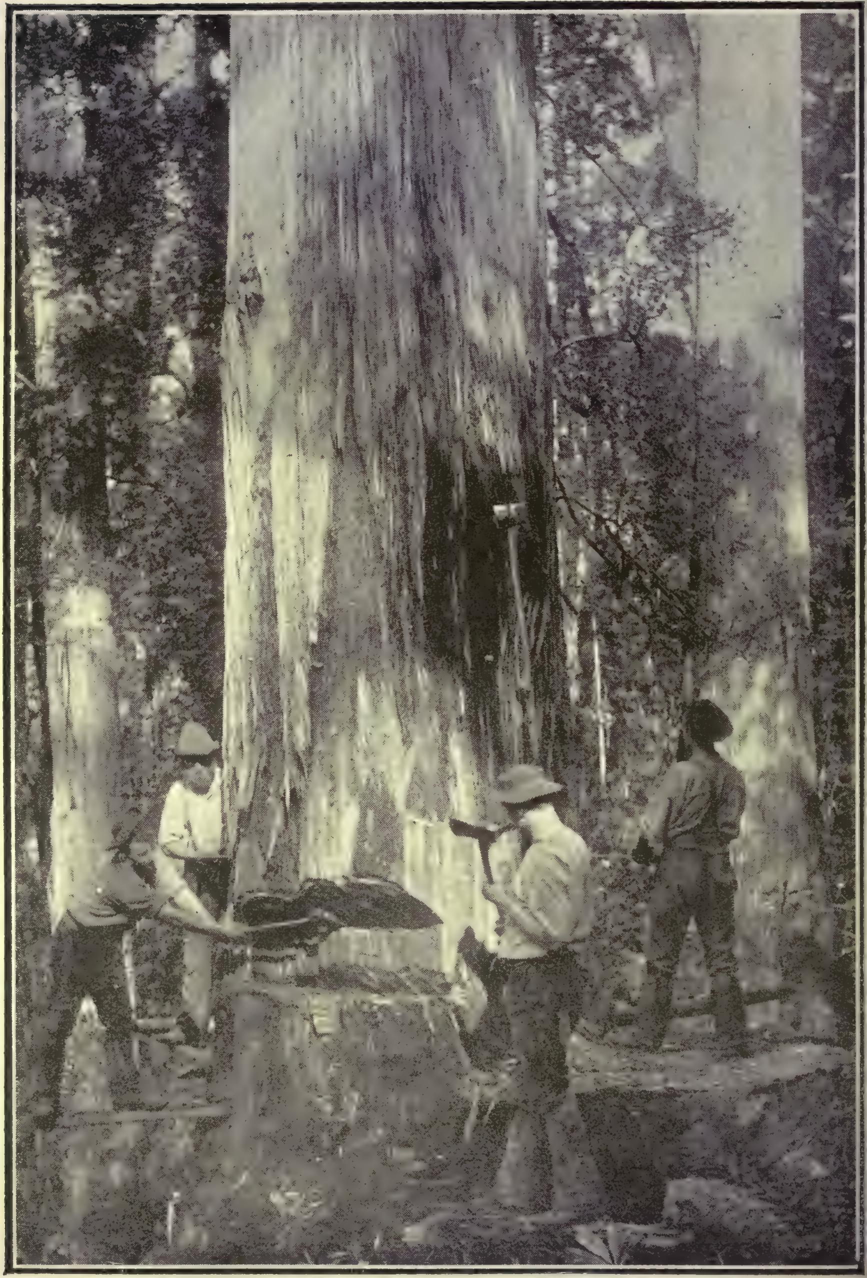
The pristine beauty and grandeur of the Tasmanian Bush is a source of admiration to lovers of nature in its wildest state. Romantic spots are met with where the swirling streams and waterfalls rush down the fern-clad gullies. Gigantic trees of the Eucalypti rise above the thickets of Wattle, Sassafras, and groves of Myrtle and Musk, amidst a luxurious wealth of vegetation, where lovely flowers and shrubs flourish to perfection, while the variety of trees and colouring, with the immense tree ferns, help to make the virgin forest seemingly tropical in appearance. The air around is scented with the fragrant perfumes from the golden bloom of the Wattles, and the aromatic fragrance of the Eucalypt, Sassafras (in their wealth of blossom), and other trees, which are often seen clinging with Clematis and different kinds of beautiful creepers, making a scene most charming and sublime in nature, that catches the eye with their brightness, and enchants all who come in contact with it. Well may the Tasmanian sing :—

"But come with me to the wattle grove,
With its featherly blossoms fair ;
For under its shade I love to rove
And breathe the fragrant air."

The Eucalypti Hardwood Timber.

THE Forest region of Tasmania produces more than fifty different varieties of timber trees from which woods suitable for almost any purpose may be obtained and put to multifarious commercial uses, the predominant tree being the Gum, rising with a straight clean barrel to a greater height than any known tree. These forest giants are confined to the Eucalypti, or Hardwoods, and being indigenous to the soil of Tasmania, they flourish here luxuriantly in their natural state. The growth of this tree is a proof of the mildness of our climate, as it will not thrive in a climate so cold as England. The Eucalypt, which has no petals, and very numerous stamens, is to all intents an evergreen; although the growth of the tree is practically quiescent during the winter months (May to August), there is no actual stoppage of the growth, as in the case of European trees, consequently the sap is always to some extent circulating. The forest trees of Tasmania are all evergreens, with the exception of the Myrtle (Fagus cunninghami), and besides producing valuable Hard and Soft Woods, there are some in much request for cabinet work that cannot be surpassed, amongst which are a few very handsome decorative woods. The most important and best known of these trees for their commercial value in most demand for export are the Blue Gum (Eucalyptus globulus) and the Tasmanian Oak (Eucalyptus obliqua), owing to their larger supply and peculiar characteristics in length, dimensions, and durability.

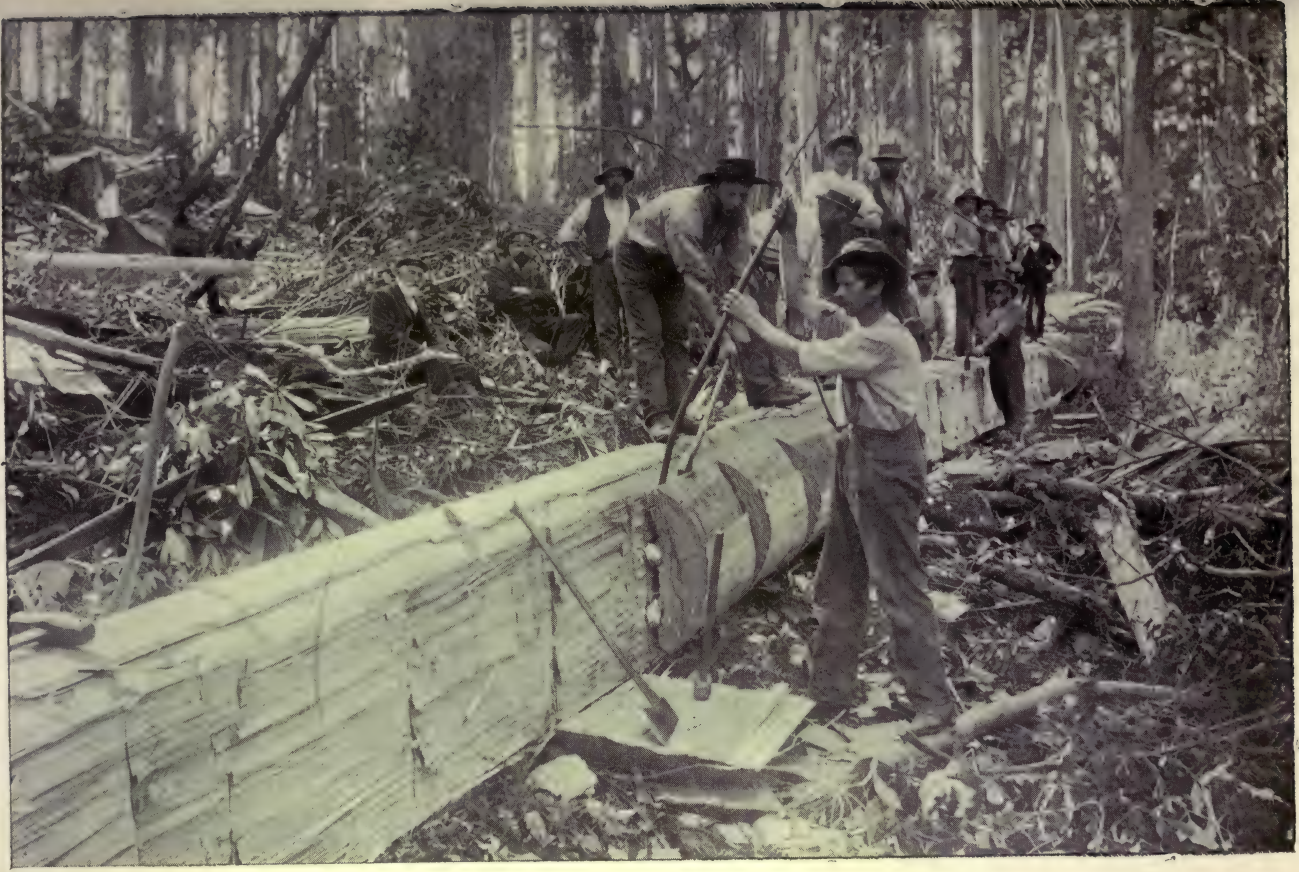
The former derives its name of Blue Gum from the colour of the young growth, which is of a glaucous blue tint, and from the large seed vessels which appear of a



Felling a Stringy Bark Tree in the Forest, Adventure Bay, Southern Tasmania.
GRAY BROS.

globular form on the tree. In size it compares with Jarrah and Karri, but is heavier than these timbers, and it is a much superior wood to the kind known by the same name found growing in some of the mainland States. It is quite as immune from the ravages of the sea-worm as Greenheart, and is of great durability and high specific gravity, being at least 5lbs. heavier per cubic foot than Australian, with which good Tasmanian Blue Gum must not be confounded. The colour of the matured wood is Golden Yellow to Purplish Brown or Buff. This wood is now getting rather scarce, and we cannot rely on obtaining supplies in any very large quantities. The "Eucalyptus globulus" was discovered by the French botanist Labillardiere when in Tasmania in 1792, and received its name on account of the formation of its seed-pods; it is derived from the two Greek words signifying "I conceal well," the cup for a long time concealing the stamens. The name of "Globulus" was taken from the resemblance of the fruit to a coat button. Tasmanian Oak is a more widely distributed tree than Blue Gum; it attains an immense size, and is much used now for the same purposes as Blue Gum, as its qualities are similar, there being little to choose between them, and for Piles and Railway sleepers especially is better preferred. The wood resembles Blue Gum in appearance, but it is lighter in colour, and varies from a pale straw resembling Ash to a reddish brown like Oak, and is straight in the grain, similar to the English Oak. It is used for all purposes, and is superior to English Oak, the breaking strain is greater, and the wear is everlasting, and it is considered to be a much more excellent wood to the Australian Stringy Bark. The distinguishing name, "Obliqua," is from the leaf, the two lobes of which are unequally divided by the midrib, and the foot stalk springs from one side obliquely, not from the middle end of the leaf. It is locally termed "Stringy Bark" from its bark, which is of great thickness and of a fibrous nature. The Bark is suitable for the manufacture of paper. The commercial value of the Tasmanian Hardwoods is every day gaining more general appreciation in the English and Foreign Markets now their wonderful physical properties are becoming better known, and they have attained a world-wide reputation for strength and durability. It is not the lowness of the price which causes the demand for our Timbers, but because the Hardwoods sent from this State have been found more suitable than any other for certain purposes. The demand for our Hardwoods in the other Australian States and New Zealand, where their qualities are much appreciated, has long been in existence, and their use is much increasing, as is evident by the large export trade now done between Hobart and Southern Channel Ports with the various Interstate Ports.

These Hardwoods are of the strongest as well as the most durable and densest timber in the world, and are of remarkable high specific gravity. They possess great immunity from the attack of marine and land insects, and for Railway and Harbour Construction Work are invaluable. These timbers are of the very few of the kind in the world of such great lengths and of such high specific gravity for use in salt water capable of resisting the sea worm that can be obtained in anything like large quantities, and at a moderate price. Blue Gum will sustain double the weight of English Oak before breaking, and will even regain its elasticity after bearing a weight at which Oak breaks. The wood of these Hardwoods contains a resinous substance which renders it most suitable for use in seawater, as it resists the Xylophages, that horror of the jetty and bridge builders. There is an essential oil in the wood which prevents it rotting under exposure to wet, and at the same time acts as a preservative to iron. It stands great exposure to heat and damp, besides possessing this valuable property of repelling the white ant and teredo worm. The wood being comparatively non-flammable renders it excellent as a fire-resisting material. These Hardwoods are rapidly coming into demand in various parts of the world for all purposes where toughness and durableness are essential, especially for general constructive works in necessary contact with soil and water, for the wood being stringy and non-absorbent is not hurt by the damp, and has little tendency to expansion and contraction. For all purposes where timber is required to resist white ants and the teredo worm, Blue Gum and Tasmanian Oak is unequalled, there being many instances of this timber having been in the ground or in water for nearly half a

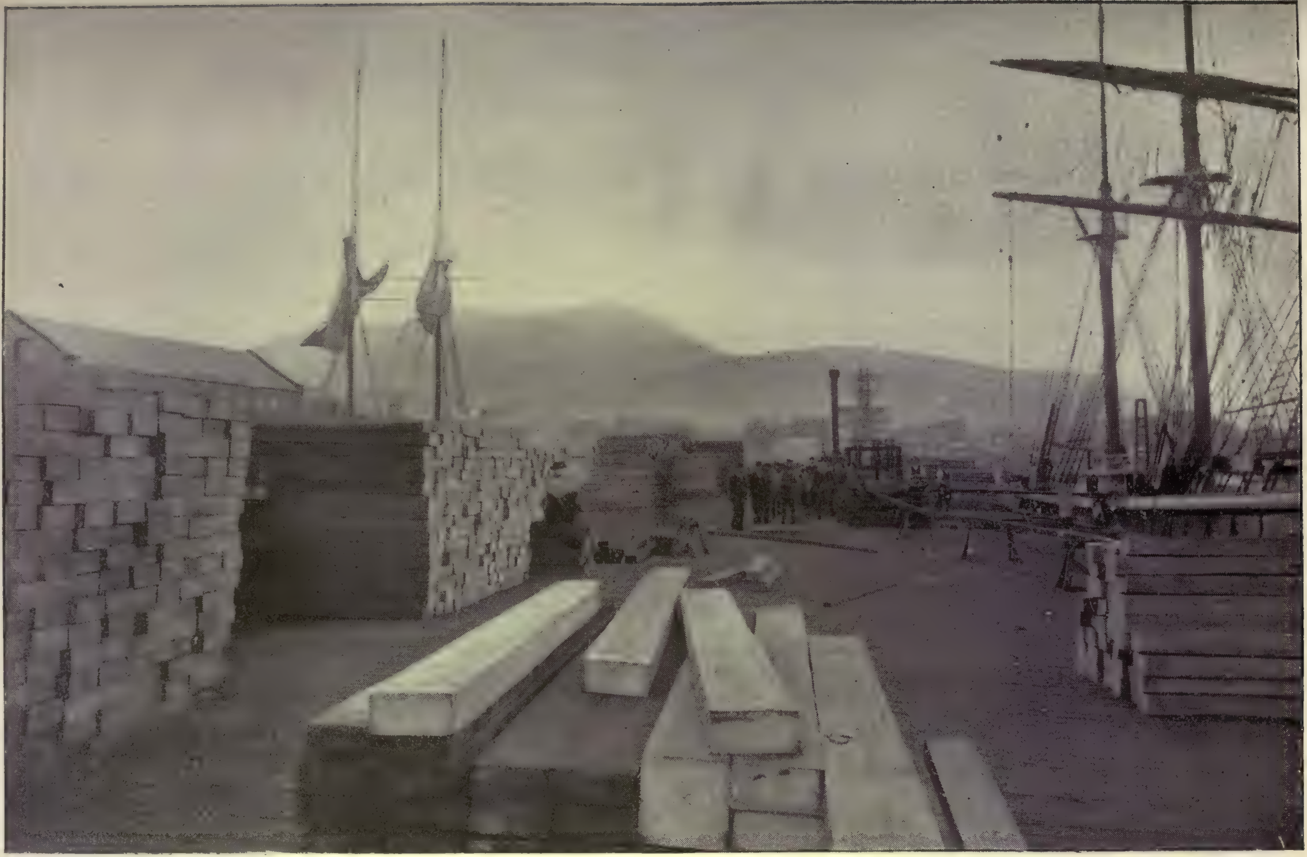


GRAY BROS. Squaring Piles for Dover (Eng.) Harbour Works, Tasman Peninsula, Southern Tasmania.

century, and then being as sound as on the day on which it was put in. The comparative non-inflammability of our Hardwood is of great importance to all who are interested in engineering and structural works, especially in Mines, Tunnels, and Underground Works, in which immunity from fire is a matter of the greatest concern. For Mining purposes our Timber is largely in demand, and is admirably adapted for underground and surface work, being capable of bearing a very great strain, and is not liable to snap suddenly, but will bend, and always give a certain amount of warning before giving way. In this respect it differs from the West Australian timbers, which are liable to snap off suddenly, the breaking strain of our wood being greater than that of Jarrah wood. In tests made in 1897-8 by the South African Mines, Stringy Bark proved superior to any other of the timbers used for withstanding the concussion of the Rock Drills, and the Dry Rot caused by the fumes and heat given off from the explosives used in the underground workings. It is now used in large quantities, and much preferred by the Mining Engineers in South Africa to any other wood for this purpose. In comparison with Oregon Pine, which has been used hitherto in large quantities for timbering by some of the principal Australian Mines, Stringy Bark is now gradually superseding it in preference, as its extra weight compared with Oregon Pine minimises the risk of accidents, and in the event of fire underground the resinous quality of Oregon makes it a very dangerous element; and this was very much in evidence in the big fires which have occurred underground during recent years at the Broken Hill Mines. The fumes also from burning Oregon are most overpowering. We have supplied large quantities of Stringy Bark to the chief Mines in the Australian States, Tasmania, and other countries.

Blue Gum and Tasmanian Oak Trees grow to an enormous height and girth, and the wood being hard, strong, and tough, and very durable, they are, for their solidity, of great value in the building of Breakwaters, Docks, and Wharves, as their high specific gravity is such that it is unnecessary to weight the piles to get them into position when in deep water, thus saving a great expense, and thus also prevents the piles being lost if carried away, or broken by accident or storm, from becoming a floating danger to shipping, etc., as they sink where they fall, and can be recovered again. Great Piles are hewn out of these trees, 100 to 120 feet in length, 20 inches squared, and as they have very little taper, are easily made parallel from top to bottom, similar to those supplied by our firm to Sir Weetman Pearson & Son Limited, Contractors for the National Harbour Works at Dover (E.) and Malta; also to Sir John Jackson Limited, for the Naval Docks at Keyham, Devonport (E.), and the Admiralty Works at Simon's Town, South Africa. These piles which we sent were acknowledged to be the longest and biggest, and the most durable that ever reached British shores. Sir Gerald Strickland, Governor of Tasmania, stated in his Presidential Address to the Tasmanian Royal Society, 8th May, 1906:—" The " growth in the size and depth of modern steamers is " increasing with marvellous rapidity. The necessity " by which Harbour Authorities all over the world are " being pushed to provide Wharfage for large draught " steamers will, undoubtedly, increase the demand for " Heavy Piles, such as were supplied from Tasmania for " the Dover Harbour Works. It is easier for Tasmania " to hear that a new Harbour is projected than for the " Contractors to know how easy it is to procure in Tasmania piles of extraordinary length, strength, and " specific gravity."

These woods will stand for a very long period, most remarkably well in water, especially in sea-water, and no limit appears so far to have been reached to their longevity under water. A Blue Gum tree of full growth will average 7 feet diameter at the butt, 100 feet in length to the lowest branches, and from 200 to 250 feet in extreme height, taking probably 300 to 400 years to attain its full dimensions. For Wharf and Bridge Construction, for Piles and the heavier timbers of superstructure, it is superior to anything produced in the Australian States. For Bridge or Wharf Decking, it would be hard to find its equal for durability if laid when thoroughly seasoned. The high specific gravity of the timber, its capability to withstand hard driving, and its partial immunity from the ravages of the Teredo worm render Blue Gum specially adapted for Piling purposes. Some idea of the density of this wood may



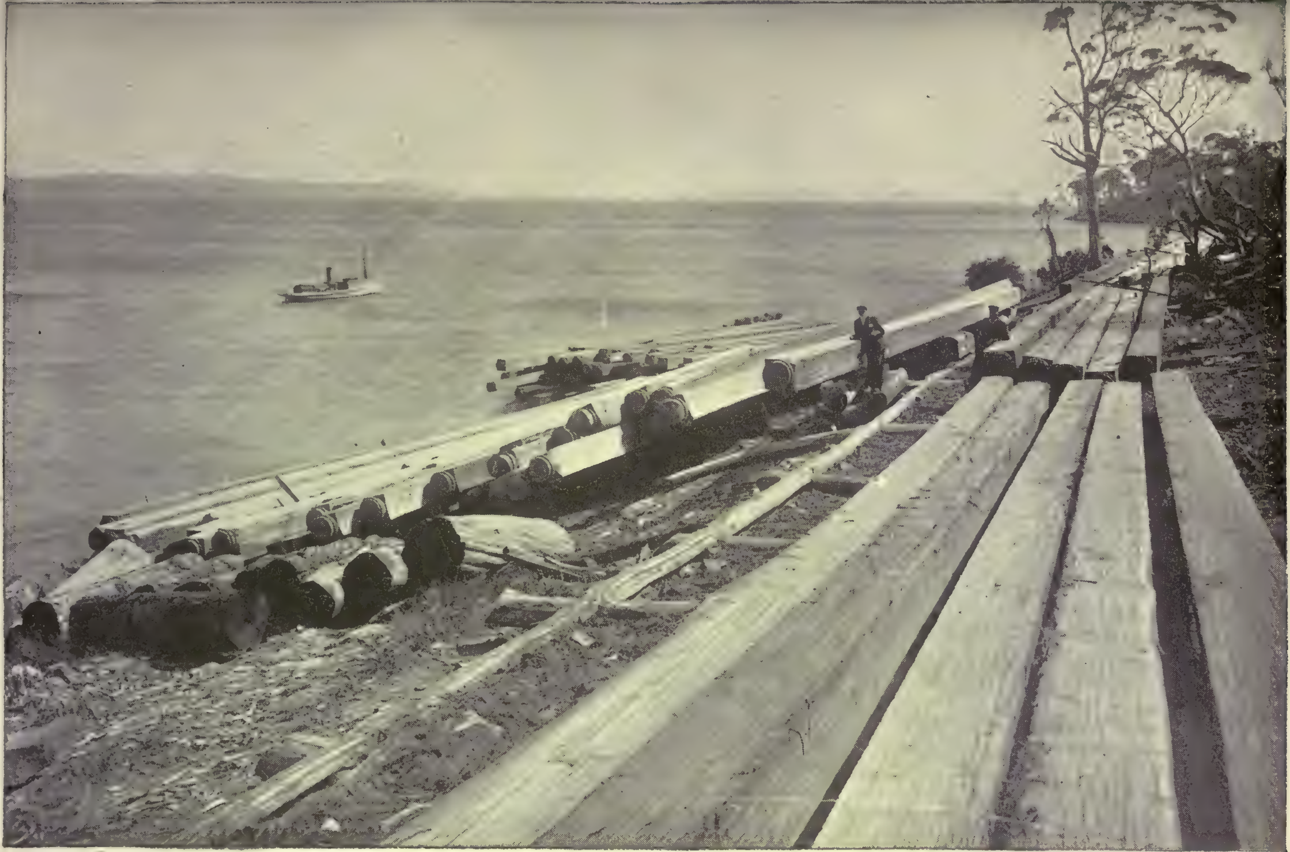
GRAY BROS.

Shipping Sleepers at Hobart, Tasmania.

be better understood when it is stated that it has a specific gravity of 75lb. to the square foot, whereas water is but 65lb. Tasmanian Oak weighs about 69lb., and other Tasmanian Hardwoods from 55lb. to 70lb. per cubic foot in the log. A pile of Blue Gum, therefore, 100 feet long and 20 inches square, would turn the scale at nearly 10 tons, while an Oregon log of similar dimensions, having only a specific gravity of 48lb. per square foot, would only weigh 6 tons, and consequently float. To cut a pile 100 feet long, a tree is required 15 to 18 feet in girth, 5 feet from the ground, and about 150 feet to the first branch. If required, Piles up to 160 feet in length could be cut from some of these trees. In a test of strength between Blue Gum, English Oak, and Indian Teak, both Elwood Cooper and the late Baron von Müeller state the Blue Gum carried 14lbs. weight more than the Oak, and 17¼lb. more than Teak upon the square inch. The specific gravity of Blue Gum is about one-tenth greater than that of English Oak, whilst the strength of the former is nearly twice that of the latter. In a test made as to its value for war purposes, it was found that a cannon ball would pierce the planks, cutting a round hole, and passing through without splitting the planks. Tasmanian Oak is probably the most valuable tree that Tasmania possesses, inasmuch as it produces a timber of excellent quality suitable for all Construction Work, and by reason of its general distribution throughout the Island, gives the largest supply of timber requisite for extensive Sawmilling purposes. The average tree at maturity is of even greater dimensions than Blue Gum, often obtaining a height of 250 feet, with a diameter of from 12 to 14 feet at the butt. The wood is, generally speaking, more open and free in the grain, and of lower specific gravity than Blue Gum, but equally durable and adapted for many similar purposes for which that timber is used, such as in Piles, Wharf, and Bridge Timbers, and so far is proved to be a better resister to the seaworm than Blue Gum. There are few, if any, timbers of the kind procurable of the longest lengths, in any of the Australian States, or elsewhere, impervious to the Teredo worm, that can compare with these Tasmanian Hardwoods in their adaptability for Marine Constructive Works. Being as good, if not better than Greenheart for this purpose, and cheaper in price, they are coming now much into favour in many countries, in preference to other Australian Woods, for use in this special class of work. The superior quality of these Hardwoods also makes them especially well adapted for Shipbuilding, Street Pavements, Carriage and Waggon Building, and for Wheelwright purposes. Tasmanian Oak is marvellously non-absorbent and resistant of damp, making some of the finest Railway Sleepers in the world. This timber is preferred for Sleepers to Blue Gum, being much used for this purpose, and has a life equal to, if not greater than Blue Gum. Peppermint and Ironbark also make good sleepers, but the supply of these is not obtainable in large quantities at a reasonable price. About 75 per cent. of the Sleepers used on the Tasmanian Government Railways are of Tasmanian Oak, and gives every satisfaction. The average life in Tasmania of Sleepers resting on gravel ballast and subjected to a rainfall varying between 20 to 60 inches per annum is about 15 years, though they have been taken up after over 20 years in use, and found in sound condition. Some of the Forest Tramways in use by the Mills have been laid with Stringy Bark Sleepers more than 50 years ago, and these Sleepers are still perfectly sound, after doing an enormous amount of work in heavy timber traffic day after day the year through. The durability of wood in favourable circumstances is almost incredible. Pieces of wood, wooden caskets, and wooden articles, have been taken from Egyptian Catacombs, constructed 2,000 or 3,000 years before the Christian era, and yet found to be in a fairly good state of preservation. Tasmanian Sleepers, owing to the natural facilities existing, can be exported at a lower price than those from any other of the Australian States. Tasmanian Oak also makes beautiful furniture, and is universally used throughout the Colonies as the best wood for flooring, its wear being everlasting.

MOUNTAIN ASH (Eucalyptus regnans),

locally known as Swamp Gum, resembles Blue Gum in outward appearance, but the timber is more open and free-grained than Tasmanian Oak or Blue Gum, and it attains immense proportions, even of greater size than these trees. The wood is light brown to white in colour,



GRAY BROS. Blue Gum Piles (100 feet in length) awaiting Shipment, Norfolk Bay, Southern Tasmania.

and when dry is of great strength, and makes an excellent Furniture Wood for Wardrobes and inside fittings for houses, having a bright sparkling grain, and takes a very good finish; it is largely used for Palings and Packing Cases, also Cable Poles. It is of low specific gravity, and floats easily in seawater. We can supply it in any quantity.

GUM TOPPED STRINGY BARK

(Eucalyptus hœmastoma),

is somewhat similar to Tasmanian Oak, but does not attain the gigantic size of this tree, but grows up to 200 feet in height and 4 feet in diameter. It is a close straight-grained timber free from knots, light, tough, and durable, used in all works of construction. It is much in use for House Building, Floor and Skirting Boards, and an excellent wood for Carriage and Wheelwright purposes. It can be used also for Railway Sleepers. The supply is very plentiful.

BLACK PEPPERMINT (Eucalyptus amygdalina).

This variety is called "Amygdalina" from its almond-like leaves, and "Peppermint" from the scent of the leaves. It is the giant Eucalypt of Tasmania, and for size this tree has been described as the tallest on the globe, only rivalled by the "Wellingtonia gigantea" of California. The wood varies from straw to a brown red colour, and is one of the most durable of any of the timbers in the State, but not to be got in large quantities within easy reach of a shipping port. It is straight-grained, and fissile, saws, planes, and bores well, durable in the ground, and makes good Sleepers. Is excellent for making Mauls, Tools, also Paving Blocks, and is used in all Construction Works, and for Engineering Work.

WHITE GUM (Eucalyptus viminalis),

so called from its very white silvery bark, grows to a large diameter, 8 to 12 feet. The wood is reddish when green, and from pale straw to ivory colour when seasoned. It does not last in the weather, and is used chiefly for floors, internal fittings, and the making of furniture. When used for wardrobes and polished, it has much the appearance of Ash. It can be got in wide planks.

IRON BARK (Eucalyptus sieberiana),

This tree grows from 100 to 130 feet high and from 2 to 4 feet in diameter, but is not to be got within reach of a shipping port. The timber is used for general construction works, piles, and makes very good sleepers. In appearance it is similar to Tasmanian Oak, and is adapted for many general purposes similar to those for which Blue Gum and Tasmanian Oak are used.

CIDER GUM (E. gunnii),

named from its sweet sap, and produces valuable timber, but not procurable in sufficient quantity.

WEEPING GUM (E. coriacea)

produces good and mild timber, but the supply of it is insignificant.

There are varieties of other Gum trees, but which we do not refer to, as few of them will produce timber of any use commercially.

The tendency to split in drying is common to all Hardwoods, and more particularly in woods of the Eucalyptus species, which being practically an evergreen contains more moisture, when freshly felled, than deciduous trees, as the sap is always to some extent circulating.

Seasoning cracks in Tasmanian Oak, when cut green and exposed to the stringent conditions of sun and wind, mostly appear in the ends of the freshly-cut timber. If the ends and sides are not protected, they dry on the outside when exposed to weather influences, remaining wet internally; the partially dried parts near the surface shrink, and in shrinking crack. These splits or suncracks that arise whilst seasoning, are characteristic of the timber, owing to its fibrous nature, are always present in a more or less degree, and in no way detrimental to its soundness for use. These cracks are not injurious to the strength and durability, for they gradually close up as the process of seasoning proceeds, until the timber again becomes consolidated—and shows no more surface shakes than an ordinary piece of well-dried oak. When appearing in sleepers more than the average life may be expected from them.

To prevent splitting the ends of freshly cut scantlings and sleepers are generally coated with some greasy composition. Freshly-cut Hardwood Piles, when not required for immediate use, should be carefully protected from weather influences, preferably by immersion in water, the wood being of sufficient specific gravity to readily sink.

Most Tasmanian Hardwood is sold unseasoned. The usual allowance for the shrinking is from half-an-inch to an inch to the foot, or 4 to 8 per cent., and they lose from 22 per cent. to 40 per cent. of their weight in drying.

Tasmanian trees being very large, may be got free from knots, and with the grain evenly hard; well selected timber free from shakes and defects. Bridge Beams and large Wharf Timbers are cut "on the quarter," not sided down out of round timber, as is done with smaller European trees.

A period of a quarter, or even half a century, must elapse before a solid plank, hardened by age, can be obtained from even a rapid growing tree. It is estimated to require even 20 to 25 years before a sleeper of Blue Gum Wood (the E. globulus being a rapid growing tree) can be obtained from a tree planted in ordinary soil.

Perhaps the greatest claim for the Eucalypti is that they improve the climate of the region wherein they are grown. The Blue Gum variety is believed to be especially beneficial for this reason on account of the extraordinary power of its roots in absorbing moisture, and for the salutary pungent and odorous exhalations from its leaves. This tree has been widely planted in malarial districts, owing to the wonderful faculty it possesses of destroying miasmatic influences in insalubrious climates, and for its rapid growth. It is claimed that all parts of Australia where it is grown are free from malaria, and that along the shores of the Mediterranean, where the tree has been planted, the disease has been entirely stamped out. The Eucalypti are transplanted by means of the seeds, and for that reason are more apt to grow and be healthy than are many trees grown by cuttings. They have been cultivated with success in South Africa, India, the Southern and Western States of America, Egypt, Algeria, and the countries of Southern Europe.

Professor Bentley, referring to the trees of the Eucalyptus family, states that nearly all of them are highly valuable, and that the genus is one of the most important to man in the vegetable kingdom. There are some 150 species of the Eucalypts, varying widely in appearance. All varieties are evergreens; they range from immense trees down to low shrubs, some bloom continually, some at certain seasons of the year only. The flowers are oftentimes very brilliant and beautiful. Many of the species are vigorous growers, and a few are especially noted for the rapidity of their growth. The Blue Gum, especially in South Africa, has been found to flourish exceedingly well under varied climatic conditions, and a well-grown tree can be grown in three years, and so rapid is its growth that a forest may be formed in twenty years. In many of the semi-tropic regions of the world these trees are the most suitable of any grown for forest cover. They have proved almost invaluable for preventing the running off of water, and in regions where the rainfall is sparse this cannot be over-estimated. The trees are good for lowlands in warm regions, as they reduce the amount of stagnant water, and in other ways render such localities more agreeable. Some varieties of these trees can thrive at an altitude of from 4,000 to 6,000 feet. As gum trees do not shed their leaves at a given season, but slowly renew them in part, there is less need for such trees to store up nourishment in the roots, the more so since all parts of the tree, leaves, twigs, etc., are filled with stores of oil rich in hydro-carbons. If a gum tree happens to grow in a country where the rainfall is heavy, there will be less need for an extended root system than would be necessary in a very dry country, and therefore the tendency would be to reduce the number of roots. Of course if a dry country is under consideration, it will be obvious that more roots will be required to extract moisture from the soil, hence Australian trees keeping up a larger root-system than similar trees in Tasmania which has a heavier rainfall.

The seeds of the Eucalypts, which are very small, are also marketable for planting purposes. The seeds of the Cider Gum are inquired for planting purposes abroad in districts subject to frosts, where other gums do not flourish. The seeds of the Blue Gum, Tasmanian Oak, Gum Topped Stringy Bark, and Peppermint, are in demand for Foreign countries, more especially Tropical parts. It is estimated in Blue Gum that there are 50,000 seeds in 1lb., and that 40,000 will grow, being equal to 2,500 to the ounce. One pound weight should produce many thousands of plants. If the seeds are fresh and good, they will sprout and come through on the eighth day, and there should be no difficulty in sprouting them in the open air in mild climates, but the greater the heat the better success.

The trunks of the various gum trees above six to ten feet from the ground have a small amount of taper, but from two feet below the ground to this height there are curving buttresses springing from the roots, which all unite to form the trunk of the tree. This part of the wood is so hard to chop, that trees are never felled less than three feet from the ground, and often scaffolds are erected to enable the woodmen to cut the tree through at the point from six to twelve feet above the ground. These stumps are left as they stand, and often contain the most beautiful wood, from a yellow to a bistre brown colour, crinkled and waved and barred, the grain of which, when polished, has a singularly bright appearance. Very occasionally such stumps of trees are got up, and are reduced to panels for wardrobes and drawer-fronts, but as a rule they are entirely neglected, and left to decay where they grew. This ornamental wood can be supplied in quantity, and natural curves very suitable for furniture-making can be got.

LOCAL NAMES OF GUM TREES.

Blue Gum.—E. globulus (Labillardiere).

White Gum.—E. viminalis (Labillardiere).—This is also called Manna Gum and Swamp Gum.

Weeping Gum.—E. coriacea (A. Cunningham).

Ironbark.—E. sieberiana (F. v. Müeller).

Gum-topped Stringy.—E. hæmastoma (Smith). Also called White-topped Stringy.

Tasmanian Oak.—E. obliqua (L'Heritier). Also called Stringy Bark.

Swamp Gum.—E. regnans (F. v. Müeller). Also known as Mountain Ash, Gum-topped Stringy, Peppermint-topped Stringy, etc.

Black Peppermint.—E. amygdalina (Labillardiere). This usually includes all Peppermints with stringy bark.

The Ornamental and Softwood Timbers.

TASMANIA possesses some of the most beautiful woods to be found in the whole Australian group, suitable for decorative work, and the finer description of cabinet manufacture, and some of them are in much demand.

BLACKWOOD (Acacia Melanoxylon)

undoubtedly claims first place by reason of its extensive use. It is the most valuable of the fine-grained trees of Tasmania, and its wood is one of the most handsome and useful. For many years past this timber has been largely exported to the neighbouring States of Australia and to Great Britain. Trees that are felled in the prime of their growth are not unlike San Domingo Mahogany both in colour and texture; older trees assume a darker colour, something between East Indian Teak and American Black Walnut, but possessing more "life" than the latter. The wood takes a beautiful polish; occasionally very finely figured logs are met with, chiefly of the so-called "fiddleback" description, but not infrequently possessing a bold mottle, such as is so much prized in Mahogany and other esteemed furniture woods. Owing to climatic conditions, Blackwood grown in the South-eastern and North-eastern districts of the Island is superior to that furnished by the Western and North-western districts. Mr. A. Ransome, of Chelsea, London, reported that the ornamental logs would take the place of the best Honduras Mahogany. Some of the timber is beautifully figured, and has been largely used by Messrs. Alcock and Co., the famous billiard table manufacturers, also by Messrs. Collard and Collard for pianos. Mr. George S. Perrin, F.L.S., F.R.G.S., F.R.H.S., of London, says this wood will be found to lend itself readily to the work of the carver, especially to the finer technical work of the true artist. The effect in artistic panelling and the best of cabinetmaker's work being highly pleasing. Its use for artistic decorative work in the Anglican Cathedral, Melbourne, as shown by the fine specimen of pulpit and other work, also in the English and Scottish Australian Bank, in that city, stamps this wood as very high-class indeed for work of this nature. We have supplied large quantities of this wood to the English War Office in the construction of gun carriages, and it has satisfactorily withstood all tests in the arsenals.

MYRTLE (Fagus Cunninghami).

This wood for its strength and high finish is greatly prized for veneers and ornamental work. It is one of the most valuable of our cabinet woods. It has a market in England for fret-saw work, on account of its density and superior carving qualities for cabinet work, and for the piano trade. For panelling and sundry work, Myrtle Wood will be found to be highly artistic, especially if allowed to remain unpolished, and is a good substitute for Cedar. It has been favourably reported upon by Messrs. Ransom, Saw Mill and Mechanical Engineers, of Chelsea, London, for its strength and high finish. Its value for ball-room and other floors, where there is great traffic, is shown in the fact that it wears quite smooth, does not shred or tear, and is singularly free from knots or faults. The wood is plentiful, and can be obtained in excellent dimensions, say up to 40 inches wide, without a knot. This wood some years ago (on account of its even wearing properties) was used in Tasmania for railway lines, and gave every satisfaction until the steel metal came into use. Myrtle is also suited for pier decking, and will overcome the difficulty of splintering that is found in Pitch Pine, Karri, and Jarrah. Myrtle is equal to New Zealand Kauri, and is suitable for the same purposes as that wood.

There are two varieties of Tasmanian Myrtle, the red and the white. The wood of the red variety is mostly bright pink in colour, and often beautifully marked. It is close-grained and tough. It is an attractive, sound, mild-working wood, easily seasoned, and is capable of a high polish. It is used for tramway rails, bodies of carriages and trucks, and makes beautiful furniture, decorative and cabinet work. For walking sticks, panels, and ornamental work it is excellent. The Light Myrtle is a variety of the same species, not as close-grained as the dark nor of so high a specific gravity. In colour the wood is a brownish grey, and it is used for the same purposes as the dark. "Bird's Eye" is another variety of the Red Myrtle, obtained from certain portions of the tree and roots. It is often very beautifully figured, the markings being dark pink and golden yellow. The Myrtle is also subject to a growth which produces large bosses on the trunk 2 or 3 feet across and a foot thick, which are prized for veneers and ornamental work. We can supply it in logs or planks.

MUSK (Olearina argophylla).

This tree grows up to 20ft. in height, and about 1ft. in diameter at butt. The colour of the wood varies from dark straw to reddish brown, and is often beautifully mottled, resembling "Bird's Eye Maple," only darker. The wood is of fine, close texture, works well, and takes a high polish. For joinery and cabinet work, ornamental furniture, and for veneer it is unsurpassed. The burrs often found on the trunk at the butt, give veneers of beautiful figure, and have a great reputation for furniture and cabinet making. Supplies are scarce.

COTTONWOOD (Bedfordia Salicinia).

The wood of this tree, which reaches from 20ft. to 25ft. in height, with a diameter of 2ft., is close-grained and heavy, and emits a peculiar fœtid odour when cut. It works well, is beautifully veined, and takes a high polish. It is used solely for cabinet work, for panels, and highly ornamental furniture. Billiard tables are sometimes panelled with it, and give a beautiful appearance.

There are more than a dozen other Tasmanian trees adapted for ornamental and decorative purposes, but the supply of these is limited, and, at times, difficult to obtain.

HUON PINE (Dacrydium franklinii).

This is the most useful of Tasmanian softwoods, and there is no Pine in the world more durable. There are two varieties—one a plain light straw colour, and the other a "Bird's Eye" pattern resembling maple. It is a sound mild-looking wood; it contains little sap, works easily, being free of grain. It is good under any kind of tools, and excellent in the lathe. It seasons well and takes a high polish. It possesses a resinous quality, which resists the Teredo in water, also insects and parasites. It is in much demand, and is used for ship's decking, boat-building, household fittings, and all kinds of ornamental work. It makes beautiful furniture, cabinet, and decorative work, and is the foundation of most Tasmanian marquetry work. Supplies are getting scarcer, and rather difficult to obtain at times in any large quantity.

CELERY-TOP PINE (Phyllocladus rhomboidalis).

It is a most valuable tree, and is a native of Tasmania only, and derives its name from the likeness of the leaves to those of the Celery. It is a magnificent Timber Tree, and grows up to 60 feet in height, diameter to 3 feet. The wood is a clean rich white, of fine quality, and is equal to the best imported woods from other parts of the world, close-grained and heavy, but tough and strong. It possesses a peculiar property, and that is, it does not shrink like other timber at the sides, but only at the ends. It also wears smooth, and does not tear or shred. Is used for Flooring Boards, Inside House Work, Railway Carriage Building, and General Carpentry. It is equal to Huon Pine, and is suitable for the same purposes as that wood. The supply is only to be obtained in limited quantities, not sufficient for an extensive export trade.

KING WILLIAM PINE (Arthrotaxis cupressoides).

This wood is also called Cedar or "Pencil" Pine, and is equal to the best American or Baltic Pine. There is no Pine ligher in the world. The colour varies from pink to orange, the wood is even in the grain, splits well, and works well under tools, durable and easily seasoned. It has the same commercial value as Huon Pine. Used for carriage work, spring carts, joinery and cabinet work, furniture, and boatbuilding. The supply is limited in quantity.

RED PINE (Arthrotaxis selaginoides),

Is similar in quality to King William Pine, but the wood is a deeper red in colour, and is used for the same purposes.

OYSTER BAY PINE (Frenella rhomboidea).

This tree grows to 120 feet in height with a diameter of 3 feet. The wood is a beautiful straw colour, light and close-grained, nicely marked, and takes a good polish. It is quite as durable as American or Baltic Pine, used for all purposes requiring lightness and moderate strength, interior fittings, doors, sashes, also for making furniture and cabinet work, oars, parts of agricultural implements. Supplies scarce.

We have summarised the character and properties of some of the leading Tasmanian Cabinet and Pine Woods, and it is unnecessary to go into details regarding other species, but these given are the best known woods and most in demand.

TASMANIAN AXEMEN.

The splendid workmanship displayed in the squaring of the logs exported by our firm, for all the Naval contracts, has testified to experts, proving that Tasmania has some of the finest axemen in the world. The workmanship of most of them is quite astonishing, being clean and true as that of timber cut by machinery. Indeed, at a short distance, it is difficult to distinguish whether the piles are sawn or hewn. The men are very expert with the broad axe, and also the ordinary American axe, and largely adopt the former for use in squaring piles, girders, and sleepers. In Tasmania Chopping Matches are a favourite and exciting pastime with the axemen, who are famous throughout the colonies for their prowess, and have won many championships against all comers from all parts of the world. The rapidity in which they can cut through a log of a fair size circumference is wonderful to behold, and some of these matches were witnessed by the Duke and Duchess of York while on a visit to Hobart, who were much interested in them.

GOVERNMENT INSPECTION.

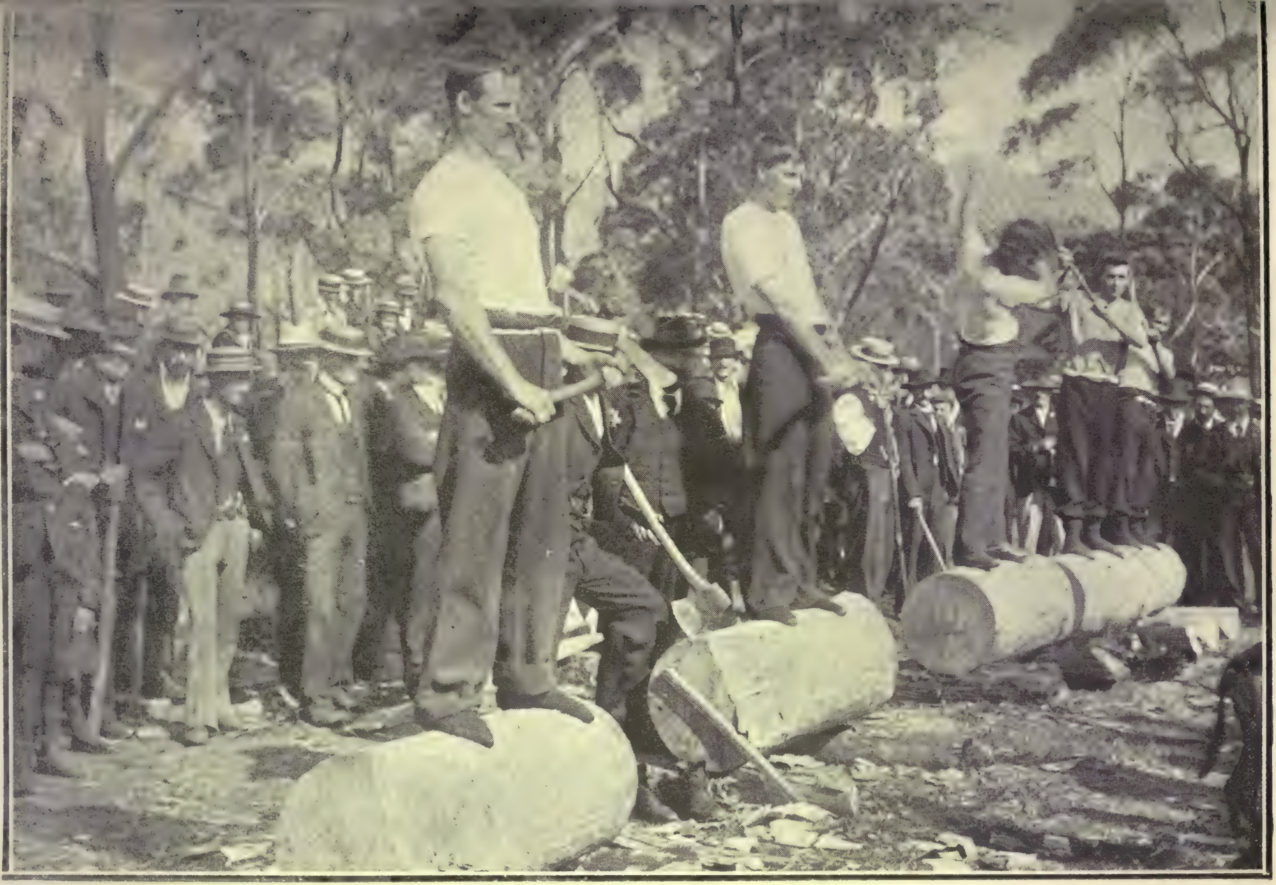
In all cases where a Government certificate is required buyers pay the cost of inspection, which is as follows:—

For sleepers	½d. per sleeper
For all other timber ...	1d. per 100ft. superficial

CHARTERING.

For pile shipments, vessels with bowports are absolutely necessary. Two bowports to each hold preferable.

We have a special form of timber charter party, which can be obtained on application.



GRAY BROS.

Chopping Match at Koonya, Southern Tasmania.

The Outports and Shipping Places IN Southern Tasmania.

A BRIEF description of the outports and loading places will probably be of value to shipowners and others in foreign countries desirous of loading vessels at any of the Southern Tasmanian outports.

ADVENTURE BAY.

This port is situated on the east side of Bruni Island, about 35 miles from Hobart, and affords a good anchorage, with deep water, in the southern corner of the bay in all weathers. Large vessels, of deep draught, can be safely loaded there by means of lighters. Smaller vessels, drawing up to 14 feet, are loaded alongside the mill wharf, which is situated in the southern end of the bay, slightly to the north of the anchorage referred to. Winds from N. to S.W. are off the land, and do not affect loading at the wharf. N.E. to S.E. are winds which bring in more or less range, but not to any great extent, except in easterly gales, in which case vessels usually haul off to an anchorage. The point to seaward, at the end of which is Pelican Island, practically shuts in this loading port from the sea, and makes a safe harbour of what otherwise would be an open roadstead.

RECHERCHE BAY.

Situated at the south-eastern extremity of the island, about 50 miles south of Hobart. Is rather difficult of approach by vessels of large tonnage, more particularly sailing vessels, the entrance being narrow and difficult of navigation to those not well acquainted with the locality. When once inside, excellent shelter is afforded in the practically land-locked bay. Small trading vessels and interstate coasters trade continually to this port for timber cargoes.

SOUTHPORT.

Situated at the southern end of D'Entrecasteaux Channel, about 40 miles from Hobart. Is a perfectly safe loading port. Vessels have no difficulty in entering the port, and find good anchorage and deep water on the southern side of the bay, in what is known as the "Deep Hole." A good wharf is here used by several mills for export loading, and vessels of light to moderate draught can lie alongside. Large vessels are loaded, as a rule, from lighters. Winds from any quarter will not affect the loading or the safety of vessels at Southport.

PORT ESPERANCE.

Situated some 8 miles to the north of Southport, in D'Entrecasteaux Channel. This port is easy of access by vessels, and is practically a land-locked harbour, with deep water capable of accommodating the largest sailing vessels or ocean-going steamers in perfect safety. Four of the larger sawmills are in this locality. There are two splendid wharves, alongside which vessels of deep draught can load, always in smooth water; whilst at the several anchorages in this well-sheltered bay vessels also lie and take cargo from lighters.

SHIPWRIGHTS' POINT (HOSPITAL BAY, OR PORT HUON).

Situated on the Huon River, about 12 miles from the mouth, and about 40 miles from Hobart. Deep, bold water for the largest vessels afloat is to be found the whole distance up to the loading port, where is provided splendid wharfage accommodation, with 30 feet of water, and alongside of which several large vessels may load at the same time. No dangers exist here from wind or sea.

D'ENTRECASTEAUX CHANNEL.

Is a smooth-water passage between the South-East Coast of Tasmania and Bruni Island, leading from the South-westward to the Derwent River. The south entrance of this channel extends from South Cape nearly N.E. by E. 20 miles to Tasman Head, the south point of Bruni Island, with sounding in 40 to 60 fathoms for the greater part of the distance across. The Channel, about 35 miles long, is slightly winding, the general direction being S. by W. ½ W. and N. by E. ½ E., but its width is irregular, varying from five miles within the south entrance to little more than half a mile in the north entrance, the depths ranging from 40 to 6 fathoms in the fairway. The Channel is entirely landlocked, and has numerous sheltered inlets, with deep water and good anchorages along both shores. Vessels are loaded from lighters alongside.

NORFOLK BAY.

This bay is situated on the northern shore of Tasman Peninsula, near the mouth of the Derwent, and is reached by passing from Storm Bay through Frederick Henry Bay. Norfolk Bay is an extensive harbour, with deep water. Good anchorage is to be found in many of the smaller inlets which exist in this bay, which is used periodically by the Australian fleet for naval manœuvres and gun practice. Vessels are loaded there chiefly by means of lighters.

TARANNA.

In Little Norfolk Bay, an inlet about one-third of a mile wide, runs 1½ mile S.S.E. from Woody Island to Taranna, where there is a pier with 9 feet water alongside, and to which there is a narrow channel with from 3 to 4 fathoms in it. This inlet is a part of Norfolk Bay proper, and is one of the best harbours in the world, land-locked, and sheltered from all winds. There is 5 to 10 fathoms of water in the fairway. Vessels are loaded from lighters.

PORT ARTHUR.

About 50 miles from Hobart. For small vessels Port Arthur affords splendid shelter in all weathers. Sailing vessels of large tonnage do not, however, generally use this port, owing to the narrow entrance, and consequent difficulty of navigation.

FORTESCUE OR DOLOMIEN BAY.

Is 1¼ mile wide, N.W. and S.E., and 1½ mile deep, with a white sandy beach; the bay is sheltered only with land winds, the Hippolyte rocks not being sufficient to protect it from seaward from heavy easterly weather; winds from north, west, and south, are off the land, and would not affect loading. Heavy easterly weather would only bring in a range, but not to any great extent. Good anchorage all over the bay, deep water being available within 50 feet of the shore. Vessels loaded from lighters.

(Note.—See Chart No. 809, Tasmanian South Coast, Frederick Henry and Norfolk Bays.)

TOWAGE.

Although the majority of these ports can be reached by vessels under sail, the services of many of the small steamers which trade from Hobart outports are often availed of, the towage charges being extremely moderate.

PORT CHARGES AT HOBART FOR A SAILING VESSEL.

Pilotage in (payable whether a Pilot is taken or not)—6d. per ton; maximum, £15.

Pilotage out (if required)—3d. per ton; maximum, £5.

Port Charges (Harbourmaster's Fee)—½d. per ton; maximum, £7 10s.

Light Dues—3d. per ton.; maximum, £25.

In the case of a vessel loading, say, Timber, at an outport, an extra charge is made for removing from one loading berth to another—£5 for the first removal, and £2 10s. for any others.

Price of Water, at Hobart Wharf, 1s. 3d. per tun of 252 gallons.

Port Health Officer: Dr. Sprott.

Fee for Bill of Health, £1 1s.

CONSULS AND CONSULAR AGENTS IN TASMANIA.

Austria-Hungary.—A. C. Dehle, Consul, 132 Collins-street, Hobart.

France.—Hon. W. H. Burgess, M.E.C., Consular Agent, Franklin Wharf, Hobart.

Germany.—A. C. Dehle, Consul, 132 Collins-street, Hobart.

Italy.—A. C. Dehle, Consul, 132 Collins-street, Hobart; Charles Henry Smith, Consular Agent, St. John-street, Launceston.

Netherlands.—Hon. Wm. Crosby, M.L.C., Consul, Collins-street, Hobart.

Belgium.—A. E. L. McGregor, Consul, 12 Elizabeth-street, Hobart.

Denmark.—John Macfarlane, Vice-Consul, 103 Macquarie-street, Hobart.

Sweden and Norway.—James Macfarlane, Vice-Consul, 103 Macquarie-street, Hobart; George Edward Harrap, Vice-Consul, 82 Cameron-street, Launceston.

United States. — Alexander George Webster, Consul, Elizabeth-street, Hobart; C. E. Webster, Vice-Consul, Elizabeth-street, Hobart; Lindsay Tulloch, Consular Agent, Cimitiere-street, Launceston.

Japan.—Under Jurisdiction of Consul at Melbourne.

Hardwood Piles.

BLUE GUM AND STRINGY BARK.

Tasmania has already established a splendid reputation for the supply of that class of heavy timber which is required in the construction of Harbour Works, Docks, Wharves, etc. The long Blue Gum piles (ranging up to 100ft. x 20 x 20) that were shipped by our firm in 1899-1900 for the Great National Harbour Works, erected by the British Admiralty at Dover, on the English Channel, having been well tested after some years in use, and very favourably reported on, also the Blue Gum piles sent by us for use at the Admiralty Harbour Extension Works at Keyham, Devonport, after being in position for several years, have given full satisfaction to the authorities, thus gaining for this State the superiority of its Hardwood for use in salt water. No traces of the "Teredo Navalis" attacks have been found on the piles sent to Dover, after seven years' immersion, and because of this, their great durability and high specific gravity, the attention of timber experts has been called to the wonderful properties of this wood for Harbour Building, as it is now admitted to be one of the strongest, most durable, and densest timbers in the world, while it is also practically immune from the ravages of the seaworm. Oregon Pine and Pitch Pine Piles, under exactly the same conditions at Dover, were completely riddled in less than two years. The density of our piles also enabled a saving to be made in expenditure of fully £10 per pile, as it was not necessary to weight the piles to get them into position. There are kinds of wood which will hardly rot in water if left to themselves, but the Teredo worm will destroy fibre and substance in forty days, and its penetrating powers, as is well known, is very great. This worm will bore into hardened clay, chalk, rock, and even concrete breakwaters. It attacks wood floating or under water. It destroyed the main sea-gates of the Dykes, and at one time nearly flooded Holland. It has destroyed solid piles of oak in 5 years, and Deal logs have been entirely honeycombed in the course of 40 days.

Tropical water is very strong, and any timber immersed is liable to be attacked by the seaworm. All Pitch Pine has to be sheathed with Muntz metal. Piling which is not sheathed is creosoted. Unlike Turpentine, which has to be driven with the bark intact, as much of its power of resistance to Cobra, etc., is apparently due to the presence of a layer of oleo-resin between the timber and bark, Blue Gum and Stringy Bark Piles require no protection against the seaworm when submerged, owing to the repelling power of the resinous nature of the wood, and no limit appears, so far, to have been reached to their longevity under water. These timbers have been used for Harbour Construction in Tasmania ever since the settlement of the Colony, with the very best results, and given great satisfaction. Some of the Piles used for Jetties built at Port Arthur, Tasman Peninsula, over 60 years ago, are still standing to this day in a comparatively sound condition without renewal, although the waters of our Harbours are much infested with the seaworm. An old Ferry Boat, built of Blue Gum in 1818, and which for more than 50 years has been lying a wreck between high and low water mark on the banks of the River Derwent, near Hobart, show no signs of decay to-day, and the wood, beyond a few stains from the iron fastenings, is perfectly sound. A portion of this old vessel is shown at the Hobart Museum, among a collection of Tasmanian Timber. The waggon ferry steamer, plying across Hobart Harbour, built of Blue Gum, has been running over 50 years, and is still doing so at this present day, without any repair or caulking to the hull. The oldest wharf now in use at Hobart was erected in 1868. Piles taken from these wharves, after having been 35 years in use, have been found in good condition, and still serviceable. These piles are up to 80 feet in length, and driven in 40 feet of sea water, and subject to the attack of the seaworm. All the piles used in the extension of the Hobart Wharves are of Stringy Bark, the lasting qualities of this timber in water having proved it to be, so far, the greatest resister against the seaworm. These Hardwoods are considered better than Greenheart for Harbour building, besides being much cheaper in price, and can be supplied by us at very moderate prices, in any quantity, from a pile hewn to any size, from a 12 x 12 to 20 x 20, up to 120 feet in length.

Hardwood Sleepers.

BLUE GUM AND STRINGY BARK.

These woods are in much demand for sleepers, as they have been proved to be most suitable for this purpose, and can be exported cheaper than those of the other Australian Hardwoods. Their use by Railway Companies are a saving in cost, as they do not require creosoting, or have to undergo any process of preservation, like Baltic or Softwood sleepers, and they will last two-thirds of the time longer, their average life being quite 20 years, though instances have occurred where they have been down in a permanent road under traffic double this time, and then been taken out in a serviceable condition. The wood, being comparatively non-flammable, makes them a valuable safeguard against conflagrations in tunnels, and especially suitable for Underground Railways. Stringy Bark is marvellously non-absorbent and resistent of damp, making some of the finest railway sleepers in the world, and owing to the comparative immunity of the wood from the ravages of white ants and other land insects, a large demand has arisen for them, and large quantities of these sleepers have been shipped to India, South Africa, and other tropical countries, where they are highly esteemed. White ants are most destructive, as they will consume the whole interior of a great timber tree in a few months, and leave nothing but its cast, made of mud, with which they cover it by night to exclude the light, should they perforate its side. Teak, although it has a very strong essential oil in the wood, and is considered to be indestructible, even has to be preserved, out in the East, with earth-oil, when put into the ground. The sleepers supplied by our firm have been used on the Dover Harbour Works, England, for the past seven years, exposed to the most trying weather, salt and fresh water, under very heavy traffic, being continually shifted and relaid as required, and yet they are in as good condition to-day as they were when first put down. The most durable Tasmanian Hardwoods last much longer in the permanent track than the timbers commonly used in Europe and North America. Thus the life of White Oak sleepers in the United States is usually reckoned from 6 to 12 years, Chestnut and Tamarack at 5 to 10 years, and Yellow Pine and Cedar at 6 to 10 years. In Europe, Oak lasts from 10 to 16 years, Larch, of the first quality, 10 years, and Scotch pine 7 to 9 years. Owing to the value of Oak it has for some years been the custom to use soften timbers, such as Beech, Scotch Pine, and Spruce, their durability being increased by the injection of antiseptic of lime. English railway sleepers are mostly 9 feet x 10 x 5, and the main source of the supply is from the Baltic Redwood. On the Continent, Baltic Oak and Pitch Pine sleepers, treated with creosote, are mostly used. For railway construction in the Commonwealth, on an average, it takes about 2,300 sleepers per mile, or, roughly speaking, nearly 250,000 for each 100 miles. The Tasmanian wood being hard, bedplates are not required under the rails of the Vignoles section of rail, which is the standard used on the Tasmanian Railways. The holding for spikes is good; the practice being to bore right through the sleeper with a ½-inch nominal measurement bit for nine-sixteenth square spike, and the splitting of a sleeper is of rare occurrence. Nearly all of the sleepers, which are 6ft. 6in. x 9 x 5, used on the Railways of this State are Stringy Bark, and give entire satisfaction, and have an average life of 15 years and upwards. On the Tasmanian Main Line, 3ft. 6in. gauge, the alignment of the track is very sinuous, many of the curves being only 330′ radius; and yet, even on these sharp curves, so great is the holding power of the spikes in the sleepers, that no bearing-plates or reinforcing braces are used. Most of the Continental, and all of the Australian and American Railways, have now done away with the use of "chairs" on the permanent way, to the alleged economical advantages of the system. Should the Railway Companies of Great Britain eventually come to adopt the same course, an increased demand should arise for our Hardwood sleepers, as, for durability and strength, there are few woods to compare with them. Being of a better class than Softwood sleepers, Hardwood may cost a little more at the outset, but their use has many advantages, and in the end a considerable saving is made.

LIFE OF HARDWOOD SLEEPERS IN AUSTRALIAN STATE RAILWAYS.

State and Gauge.	Shape.	Timber Used.	Life in Track.
Queensland, 3ft. 6in.	Hewn Rectangular and sawn half round.	Ironbark, tallow-wood, spotted gum, red stringy bark and blood-wood.	15 to over 30 years.
New South Wales, 4ft. 8½in.	Rectangular, 9ft. x 10in. x 5in., main lines; 8ft. x 9in. x 4½in., branch and pioneer lines.	Hewn ironbark.	Average 25, max. about 35 years.
Victoria, 5ft. 3in.	Rectangular, 9ft. x 10in. x 5in.; 9ft. x 9in. x 4½in.	Sawn and hewn red ironbark, red gum, grey box.	24 to 30 years. 18 to 30 years.
South Australia, 5ft. 3in.	Rectangular, 8ft. 6in. x 10in. x 5in. formerly 9ft. x 9in. x 4½in. and 8ft. 6in. x 9in. x 4½in.	Sawn South Australian red gum, blue gum, white ironbark, sugar gum, grey box, and West Australian Jarrah.	3 to 25 years. Life varies greatly with quality of timber and condition of ground; in northern parts subject to white ants.
3ft. 6in.	Rectangular, 6ft. 6in. x 8in. x 4½in.	..	..
West Australia, 3ft. 6in.	Rectangular, 7ft. x 8in. x 4in.	Sawn and hewn Jarrah.	Not known. In wear 17 years.
Tasmania, 3ft. 6in.	Rectangular, 3ft. 6in. x 9in. x 5in.	Stringy bark, blue gum, peppermint (for mountain ash)	Average 15, max. 30 years.

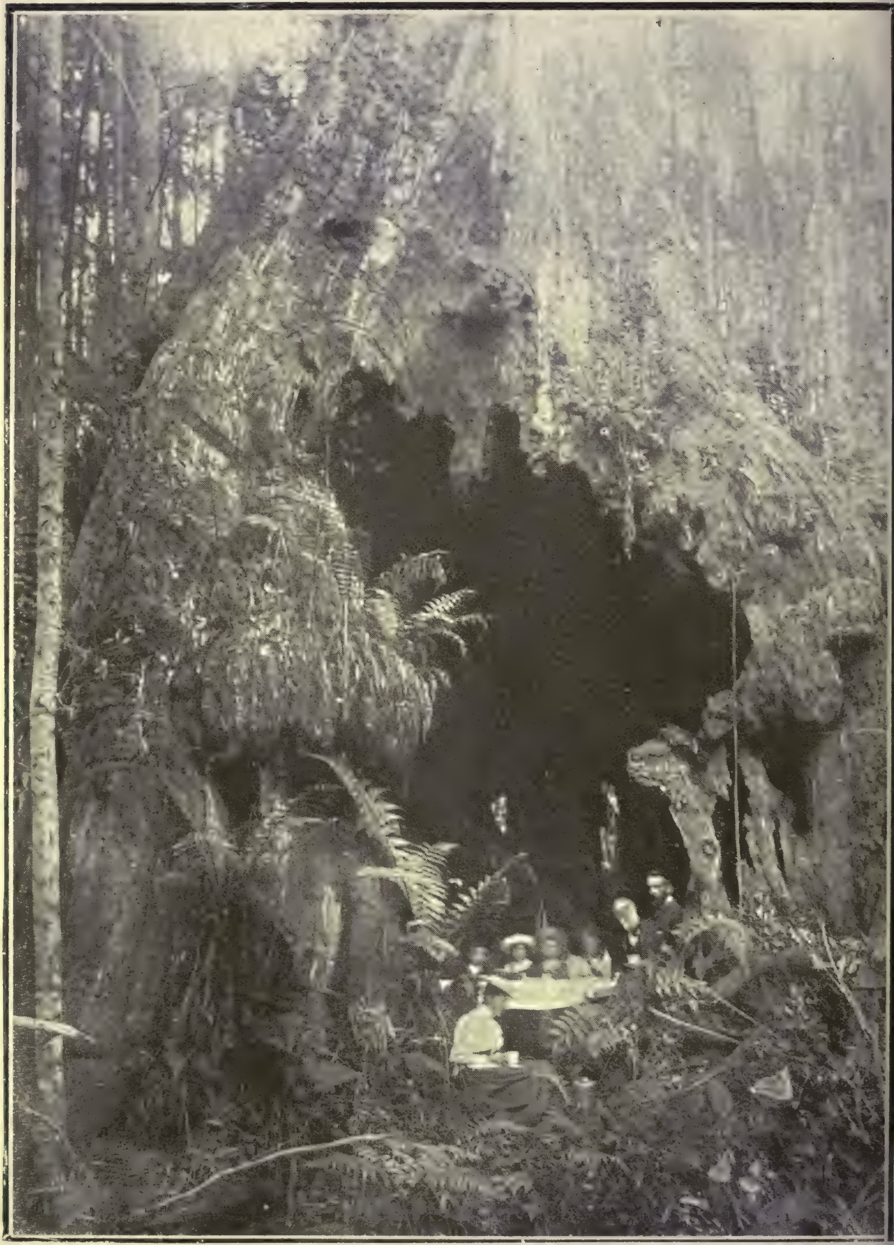
Paving Blocks.

STRINGY BARK (Euc. Obliqua).

This wood is specially suited for street pavements. With macadamised roads at their best there is a stage where the traffic outruns the wearing capacity of the surface, and then a new system must be adopted if the roadway is to be maintained with anything like economy, and in selecting a material to replace the metal there are many circumstances in favour of wood paving. It costs much more than macadam at the outset, but it lasts much longer and requires far less outlay for cleaning and repairing. On the item of repairing the case is entirely in favour of the wood-paving, as once properly laid on a cement foundation it requires no repairs whatever, and remains in its place until a new blocking is wanted. This is a saving in expense, and has the further advantage that it avoids the obstruction to traffic that always takes place where metal roads are renewed. The mode of laying found most successful in Australia is, first, to form a solid concrete foundation, accurately rendered, to the camber and incline of the roadway; second, to dip the blocks in boiling gas-tar, drain them, and again dip and drain; third, to bed the blocks, end grain up, close together, in hot pitch and tar, grouting as the work proceeds with hot tar, pitch, and sand; fourth, to pay the surface with a good coat of hot tar and pitch, with plenty of coarse sand sprinkled as the work is payed. An expansive joint is usually left between the blocking and the kerb. Stringy Bark blocks laid as above will last under heavy traffic from 14 to 20 years. This wood is preferable to Jarrah, being quite as durable, gives a better surface, and is also lighter in weight. Given equal conditions, Stringy Bark blocks will wear out two sets of the Deal, or Beech blocks, which are largely used in European cities. Stringy bark is evenly hard all through, and will not absorb moisture. The blocks do not polish under traffic, but give a good foothold for horses. The Stringy Bark paving of the roadways of the Hobart Market building, laid in 1853, are still doing duty, in good serviceable condition. A patch of road opposite the Waterman's Ferry, Hobart, laid in 1895, is in good order, and as sound as the day it was put down. The St. Marylebone Vestry (London), in October, 1894, laid 1,500 superficial yards of 5 x 3 x 9 Stringy Bark and Blue Gum blocks, mixed, in the carriage way of Mortimer-street, in front of the Middlesex Hospital, extending from Nassau-street eastwards to the parish boundary. The vehicular traffic here is very heavy, and the blocks are reported as giving every satisfaction.

The By-Products of Tasmanian Forest Trees.

One of the advantages the Tasmanian timber trees offer over those of most other countries is the numerous by-products that can be obtained from them. The Eucalypti, besides being of inestimable value for their excellent timber, are largely used for a great variety of other purposes. There is absolutely no part of the tree which cannot be turned to commercial value. It is doubtful, indeed, if any tree, except the Palm, can be utilised in so many ways, and to such an exhaustive degree; and science has unlikely yet succeeded in obtaining all the by-products that can be made from these useful and wonderful trees. As an instance of new products being obtained from the Eucalypts, is a recent invention, successfully demonstrated in London by Messrs. Johnson and Hare, of an improved process of fermentation, by which it is claimed, not only that brewers will be able to make a palatable beer of good keeping qualities, but that it will become easy, and, in fact, economically advantageous, to brew a beer containing even less alcohol than ordinary ginger-beer. This important discovery consists of a specific germ, obtained from the Eucalyptus, which ferments at a high temperature, and can be instantly precipitated by cooling the liquid. The ferment can thus be purified by heating to a point fatal to the other germs, and a beer, free from sourness and irregular flavour, practically non-alcoholic, produced. It prevents fouling in pipes and internal surfaces; saving enormous labour in cleansing. For making alcohol for motors and motor-cars, the new invention will be valuable, as motors will be available in hot climates, where they cannot be used on account of the cost of imported spirit or petrol. These trees contain a resin which is used medicinally and for varnish; the leaves give oil, and the flowers are full of honey. The oil is used in medicines, being especially efficacious for affections of the throat. It is also used in the preparation of soap. The crude product is used in making salve. The oil is very effective as an antiseptic and disinfectant. The bark contains fibre suitable for paper; also tannin. The wood is rich in pyroligneous acid, and the twigs and leaves in potash and valuable essential oils. The Blue Gum species yields a valuable gum, having properties similar to those of the East Indian gum, "Kino." Wood spirit, acetic acid, tar, may be obtained from it, also the acetates of soda and lime. The dry gum wood gives an average of 4½lb. of pearlash and 2¾lb. of potash to the ton. An illuminant, known as gum gas, can be produced from the leaves, and is said to give a bright light, but its gas producing qualities as yet have never been turned to practical account. It is estimated 10,000 feet of gas can be obtained from a ton of leaves. Oil is manufactured from the leaves of nearly every species of Eucalypt, but the best is obtained from the leaves of the full-grown Blue Gum (E. Globulus), which yields a larger proportion of the Eucalyptol of commerce than is distilled from any other species, and large quantities of it are exported to Europe and America. It is said to have important remedial powers in asthma, bronchitis, and various other diseases. The discovery and the development of the virtues and uses of Eucalyptus Oil was made by Mr. Joseph Bosisto, of Richmond, Victoria, in 1853, and since then this great medical oil has become welcomed in every land of the civilised world. Algeria, where, many years ago, millions of Blue Gum trees were planted to combat the malaria, so far, is the only country outside of Tasmania and Australia that manufactures and exports large quantities of the oil, which is sent chiefly to France. The price of this oil at one time rose as high as 7s. 6d. per lb. A similar oil is also extracted, that is used to prevent the corroding of boilers, and other machinery. These trees are especially valuable to the bee-keeper, as the nectar extracted from the blossoms is very good for bee-food. Honey made from the Eucalypts is claimed to have a peculiar medicinal flavour. Seventy to eighty ounces of Eucalyptus oil can be produced from 1,000lb. of Stringy Bark (Euc. Obliqua) leaves. The bark of this tree will also make paper. The wood of the Peppermint (Euc. Amygalina) yields carbonate of potash, acetate of soda, and acetic acid. The ashes yield at least 10 per cent. of pearlash, the inner bark pulps well, and is suitable for making coarse papers. The gum is medicinal, and the leaves yield more oil than any other of the Eucalypts, viz., 500oz. per 1,000lb. of leaves, or 3.12 per cent. There are many other trees of the Tasmanian forests besides gum trees that yield useful products. Leatherwood (Eriostemon squamens), the glutinous covering of the young shoots, is used by bushmen to apply to cuts and wounds, on which it is said to have a wonderfully healing effect. The bark of the Sassafras is used in the preparation of tonics, and in the manufacture of Sassafras beer. The tonic is held in much repute, as it acts on the heart, and is considered to be one of Nature's best tonics for the system; while pills made from Sassafras are said to be good for the liver. The native Box (Bursaria spinosa), of the order "Pittosporiæ," is impregnated with a very fragrant resin; while the Oyster Bay Pine (Frenela rhomboidea) exudes gum sandarach, and the grass tree (Xanthorrcea) a red resin, which is used as dragons-blood for staining and making varnish. The Tea Trees (Leptospermum lanigerum) have very fragrant leaves, and contain both essential oils and tannin. The bark of the She-oak (Casuarina quadrivalvis) has medicinal and tanning properties, and the leaves are much relished by sheep. Bulloakwood (Casuarina suberosa) yields 10lb. potash per ton, and the leaves are eaten by sheep, and its curious seed cones are favourite playthings of children in the bush. The bark of the Silver Wattle (Acacia dealbata) is used for tannin. It exudes a gum similar in appearance to gum arabic, which has been found excellent in the manufacture of confectionery. Black Wattle (Acacia decurrens) is the great tannin tree of Tasmania, and the tannin properties of its bark is twice that of Silver Wattle, and it is largely used and exported for this purpose. It yields a dye which makes fine writing ink, and it also has valuable astringent and aromatic properties. The bark of the Weeping Acacia yields crude potash. There is an opening for the profitable employment of capital and energy in rendering marketable the various products of our trees. Tasmanian Eucalyptus Oil, which is noted for its highest standard in the market, is already being sent all over the world, whilst as yet the trade is small, compared with what it might be. Pyroligneus acid and potash may be made, besides which the distillation of essential oils could be largely increased. The bark of some of our trees is very suitable for the manufacture of paper, and wood pulps could be made, which is a trade as yet quite undeveloped. The following is an example of what can be done in this particular line:—A recent trial was made in Austria to decide how short a space of time living trees could be converted into newspapers. At Eisenthal, at 7.35 in the morning, three trees were sawn down; at 9.34, the wood having been stripped of bark, cut up, and converted into pulp, became paper, and passed from the factory to the press, whence the first printed and folded copy was issued at 10 o'clock, so that in 145 minutes the trees had become newspapers. The test for nearly everything in these days is the amount of time required to accomplish it.



GRAY BROS.

"Big Ben" Gum Tree, at Port Esperance, Southern Tasmania. Height, nearly 250ft.; circumference (5ft. from ground), 95ft.; interior, 20 x 25 ft.

The Big Trees of Tasmania.

The Forest Trees of Tasmania can rank with the largest of those found growing in any other part of the world for their height and base circumference.

The oldest and tallest trees in the world are claimed to be the Redwoods of California; a few of the highest of these, scientists estimate, must have been 3,000 years old at the birth of our Saviour. Their age is estimated from the cross-section concentric rings of the stump. Some of the highest range from 400 to 460 feet, being over 100 feet in circumference at the base. There are ten groves of these gigantic trees, but in all there are not more than 500 of them 280 feet or over. The bark on many of these trees is said to be 40 inches thick. In the forests of Tasmania there have been found trees of Eucalypti quite equalling the Redwoods in height and base circumference. The trees of the Blue Gum and Stringy Bark are frequently met with 200 to 300 feet high, giving 150 to 200 feet clear run from the butt end to the first limb, with up to 60 feet in diameter at the base. Many have attained a height of 350 feet, and a girth of 100 feet in the Southern parts of the Island. A Blue Gum was measured 90 feet round and 330 feet high near "Tolosa," on the Northern aspect of Mt. Wellington range, and on the Southern side, a Swamp Gum 102 feet at 3 or 4 feet from the ground. A Stringy Bark, near the "Cam" River, measured 200 feet to the first limb, and the cubic measurement in the trunk alone was 225 tons of timber. Lady Franklin's Tree, near Hobart, has a circumference of 107 feet, at a height of 4 feet from the ground; and in the New Norfolk district there is a tree, the trunk of which has been burnt hollow, affording an apartment 20 feet long, wherein picnic festivities are sometimes celebrated. A plank was cut for the London Exhibition of 1851, which was 145 feet long, 20 inches broad, and 6 inches thick; and in 1862, another slab was sent to London 75 feet long and about 10 feet wide.

A fallen Blue Gum tree at Geeveston, on the Huon River, measured 330 feet long, and Baron von Mueller, the well-known Australian naturalist, says of a Blue Gum growing at Southport, in Tasmania, that it contained "as much timber as would suffice to build a 90-ton schooner."

The Peppermint Trees (Euc. Amygalina) of Tasmania are admitted to be the tallest trees in the world. Some have been measured from 416 to 471 feet in height, and one of the latter species reached 500 feet. In 1849, the Rev. T. J. Ewing saw over 100 of these trees, 40 feet in circumference, and measured one which was 60 feet at 4 feet from the ground.

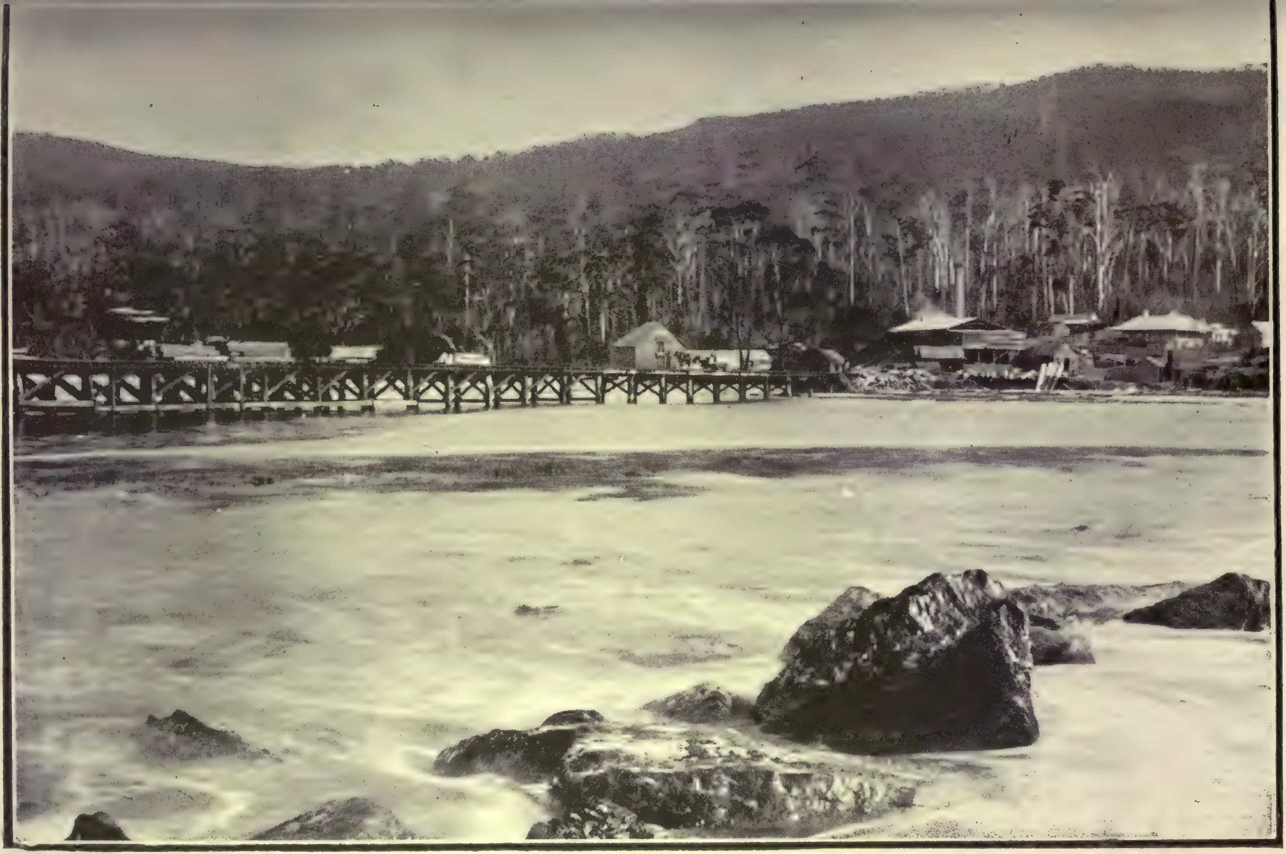
The late Mr. Calder, formerly Surveyor-General, measured the circumference of 19 trees of the common Stringy Bark (Eucalyptus gigantea) at 4 feet from the ground. The two smallest measured from 30 to 32 feet, the two largest 74 and 62 feet respectively. There were not more than from six to eight of these trees to the acre.

A spar of White Swamp Gum (Euc. Viminalis), although of small diameter, 230 feet long, was sent to the London Exhibition of 1862. When speaking of these giants, it should be borne in mind that they are not isolated cases, mere curiosities, but that trees of from 200 to 250 feet are fairly common in the forests, extending over thousands of acres in the Huon and Peninsula districts of Southern Tasmania, rising high and clear of boughs, like the masts of great ships. Many instances could be given of the extreme height of the Eucalypts. Ellwood Cooper in his work on these trees says he has seen, in Tasmania and Australia, Blue Gum, larger and taller there than he has seen the Redwoods in California. Tasmania and Victoria are the only countries in the world in which the true Blue Gum occurs naturally, where it often attains the height of 400 feet. The wood of the Blue Gum Tree of Tasmania is, however, considered to be much superior in quality to that of the tree of the same name found growing in Victoria, and is largely in demand for export to other countries. This tree is now universally known, and has been transplanted with much success in many countries. It has already become noted in all temperate climes as the "Fever Tree," and certain it is that it truly deserves its name.

The Bruni Sawmills and Forests.

ADVENTURE BAY.

The Mills and Forests of the Firm are situated in the southernmost part of Adventure Bay, called "Quiet Corner," on the seaward side of South Bruni Island. There is no place more associated with the historical past of this State than Adventure Bay, as it was here that Captain Tobias Furneaux first landed at on the 8th March, 1773, when he sighted Tasmania in the British ship "Adventure," from which the place derives its name,

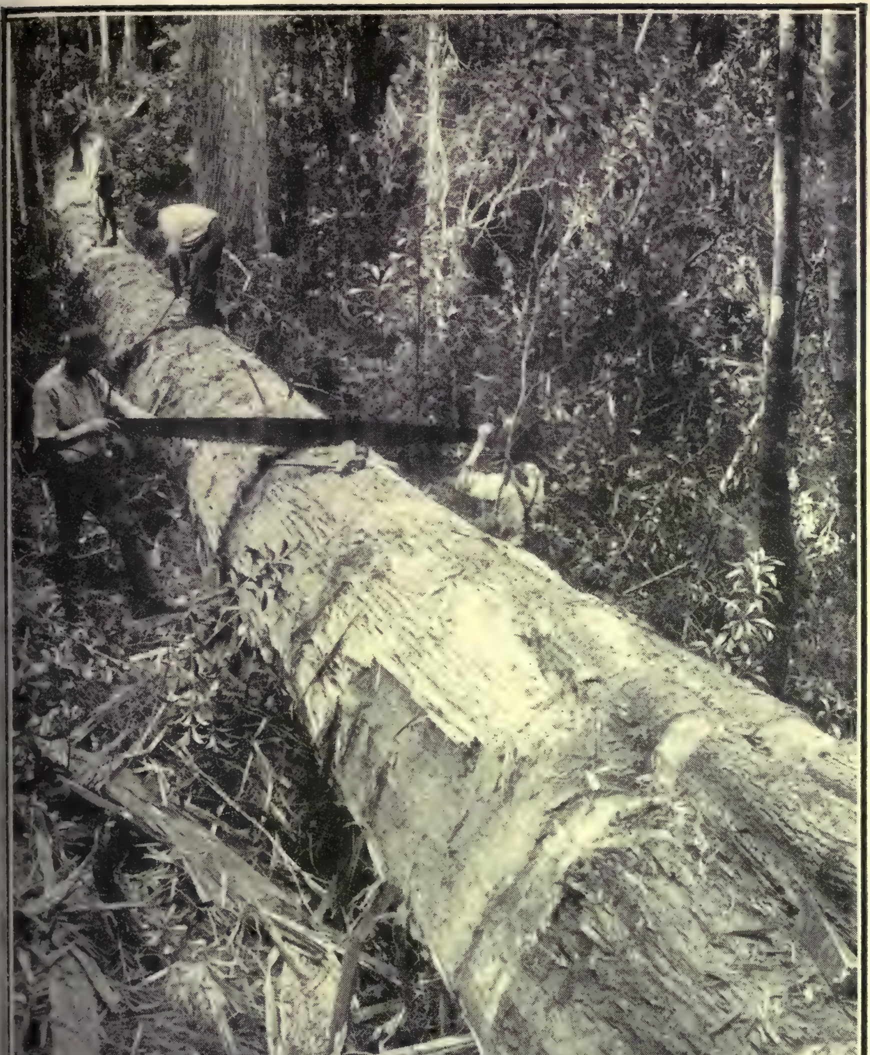


General View of Bruni Sawmills, Adventure Bay. First Landing Place in Tasmania of Capt. Furneaux, 1773, and Capt. Cook, 1777.
GRAY BROS.

and it was the first landing place in Tasmania of Captain Cook, the great circumnavigator, when on his third voyage, in the ship "Resolution," on the 26th January, 1777. Lieutenant William Bligh, who afterwards became the fourth Governor of New South Wales, in command of the English vessel "Bounty," also visited Adventure Bay in 1788. During his stay here he planted some apple and fruit trees, and was probably the first to introduce these trees into Tasmania. His ship, the "Bounty," was noted afterwards for the mutiny on board of the crew. It was on this voyage, in April, 1789, that the crew broke out in rebellion, headed by Fletcher Christian, while in the Pacific Ocean, and putting the captain and officers in a small boat they cast them adrift. The crew finally landed, and settled at Pitcairn Island (Polynesian Archipelago), and founded a colony there. They were not discovered until 1808, when all the mutineers were dead except one (Alex. Smith), who had changed his name to John Adams, and became a model patriarch. At this day there are 104 men and women on this Island, descendants of these mutineers, and they are happy in their insular domain, and speak English fluently, and are most intelligent. Lord Byron, in his novel, "The Island," has made the mutiny of the "Bounty" the basis of his tale. Adventure Bay, in former days, was a favourite resort for the whaling fleet, and was then full of stirring scenes and much activity in connection with the whale fisheries. For many years it was used as a try-out station by the Scotch and American whaling vessels engaged in the Southern Pacific trade, where the carcases of sperm whales were towed in, and tried-out. The industry flourished exceedingly from 1813 up to the "sixties," as the whales were then so plentiful, and easily captured; but since then has gradually ceased altogether. Whaling, as an industry, is now dead in these waters, owing, in a large measure, to the fact that the calves were allowed to be indiscriminately killed in order to attract the parent whales, and thus be more easily captured; also owing to the introduction of mineral oils, which are largely used now instead of sperm or whale oil, the value of the latter having fallen to less than one-half, the business then becoming unprofitable. The value of sperm oil exported from Tasmania from 1825 to 1879 was £1,200,000. In the course of time, where one industry has failed, another has arisen in recent years to take its place, by the operations of the firm in working the forests of the surrounding country, which contain some of the finest timber to be seen in Tasmania, and many cargoes have been sent away from here by the firm to all parts of the world. In Adventure Bay is to be found a beautiful sandy beach, some 6 or 7 miles in length, and within a short distance of the township is a narrow neck, or isthmus, joining the North with South Bruni Island, and dividing the ocean from the waters of the D'Entrecasteaux Channel. On this beach are to be found, after south-easterly gales, beautiful trigonia shells, and many other varieties of marine shells, which are cast up by the sea, and eagerly sought after by collectors who frequent this place. At the southern end of the Bay lies Penguin Island and Fluted Cape, a picturesque headland of about 1,000 feet perpendicular height from sea level, and which is viewed with interest by voyagers coming into the River Derwent on their way up to Hobart by the ocean-going steamers. On this Cape the whalers formerly had "look-out" stations for sighting whales. In the township is a Church, State-school, Post, Telegraph, and Telephone Office, Club, and Library. There is daily communication with Hobart via Mills' Reef by passing steamers, through the D'Entrecasteaux Channel. Anthracite coal has been discovered close to Adventure Bay, but so far has not been turned to profitable acocunt. From Adventure Bay is to be obtained a charming and extensive view of the ocean, taking in Capes Frederick Henry, Raoul, and Pillar, with Tasman Island looming in the distance, besides fine views of mountain scenery. It was on South Bruni Island, after the Black War of 1830, where all the surviving aborigines in Tasmania collected by Mr. G. A. Robinson were placed. The last remaining aboriginal inhabitant of Tasmania, Queen Truganini, daughter of the Chief of the Bruni Island Tribe, died near Adventure Bay on the 8th May, 1876.

From Hobart "Mercury," 8th June, 1903.

Gray Brothers, at their mill, Adventure Bay, which is on the open sea side of Bruni Island, have, of late, had their names prominently before the public in connection with several big contracts they have executed, notably, their supply of piles and other timber for the great harbour works, at Dover, England. The brothers (Messrs. Henry G. and Fred. Gray), with Mr. Fred. Gray as mill manager, have been operating here for about 15 years, having about 500 acres of freehold land, and leased over 1,500 acres of immense beds of timber lands from the Crown; the trees being principally Stringy Bark and Blue Gum. Their tram lines branch into a dense forest, in different directions, for about two miles, some of the



A Forest Giant (140 feet long) being Cut into Lengths in the Forest, Adventure Bay, Southern Tasmania.

GRAY BROS.

trees being 8 feet in diameter, 250 feet to 300 feet high, from which a clear run of timber, without a limb, to the extent of over 100 feet, is often secured.

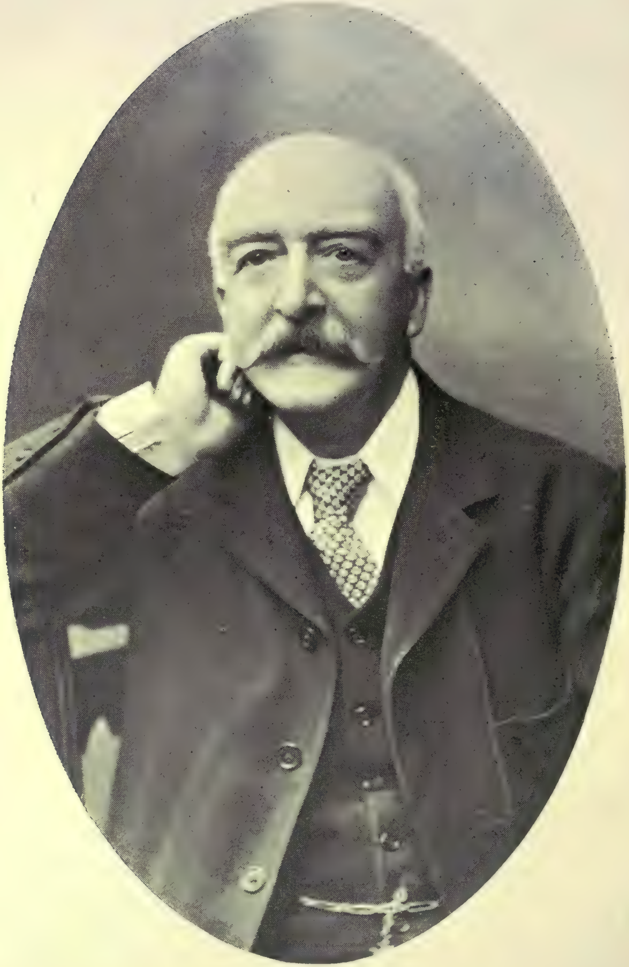
As to the mill, it has powerful machinery. There are two immense vertical frames worked, one of which carries a breakdown saw, and the other a set of "flitching" saws. Then come the usual circular "bench" ripping saws, and a steam cross-cut, attachable to the log skids, which facilitates the cutting of large quantities of timber to any uniform length desired. A new Tangye engine, of 30 horse-power, has just been put down, for driving the machinery, whilst in the forest they have a powerful steam bush hauler at work, to pull the felled logs up to the tram line. About 30 hands are employed (for whom workmen's cottages are provided), and about 50,000 feet super. of sawn timber is the quantity put out in a week; but frequently great hewn piles for harbour works are also handled by the firm and shipped. The selection of these is a great point, and in this the lengthy experience and judgment of Messrs .Gray Brothers (who have spent a lot of money in equipment and obtaining the necessary gear) stand them in good stead. For instance, the piles they sent to Dover (England), they were informed, gave great satisfaction, being well selected. They have recently been engaged in supplying great hewn logs and sawn timber for Simonstown (South Africa) Admiralty works. Most of the hewn piles to supply this order are obtained from Flinders Bay, on the peninsula. Timber of various kinds is also supplied for the Tasmanian and inter-State building trade. The deep water jetty has recently been lengthened to 500 feet, where vessels can come alongside, drawing over 16 feet of water, the jetty being capable of holding a stack of 400,000 feet of timber. The bay is sheltered from most winds, and is a historical spot, having been the first landing place in Tasmania of the great circumnavigator, Captain Cook, and only the other day some relics of that memorable landing here were found. There are 16 workmen's cottages on the property, and stabling for 16 horses. Telephonic communication with Hobart (where the firm has its chief business office), and other centres, has recently been installed. The firm have just finished supplying large hewn timber for Stanley breakwater. It was from here that the Broken Hill Mining Company got a lot of their timber, and that piles for the Prince's Wharf extension and the Alexandra pier, Hobart, were obtained.

The Tasmanian Gold Mining Company, at Beaconsfield, were also supplied by the firm with large quantities of timber for Mining purposes.

The firm have recently completed a contract for specially selected Blue Gum piles and long derrick spars, for lifting great weights, required for the construction of the New Naval Docks at Keyham, Devonport (England), now being carried out by the well-known firm of Sir John Jackson, Limited, London. About four million feet of Piles, etc., having been supplied by the firm in all the Admiralty contracts undertaken by them.

From "The Tasmanian Mail," 21st February, 1904.

In the southern part of Adventure Bay, named "Quiet Corner," the sawmills of Messrs. Gray Bros. were erected some 15 years ago by the brothers Henry and Charles, on the death of their father, at Taylor's Bay, situate on the opposite side of Bruni Island, where for many years sawmilling had been carried on; the machinery and plant of the Taylor's Bay Mill being removed to the present site in Adventure Bay. Shortly after establishing the new firm of Gray Bros., the elder brother retired from the firm, leaving Henry sole proprietor, and to his energy and particular business capability in the timber trade is due the present foremost position which the firm holds. As example of Mr. Gray's enterprising spirit, it may be mentioned that he has twice visited England and once South Africa in pursuit of business, and was able to secure two contracts of considerable importance to the industry in Tasmania, and which have assisted in no small degree towards bringing the utility of Tasmanian Hardwoods prominently before foreign buyers. One of these contracts was the supply of Hewn Piles, 18 x 18 and 20 x 20, up to 100 feet in length, for the Admiralty Harbour Works now being carried out by Messrs. S. Pearson and Son, Ltd., at Dover, England, and for a recent contract with the firm of Sir John Jackson, Ltd., for similar Harbour Works at Simon's Town, South Africa, a large quantity of Hewn Piles having been shipped; also a cargo of about 600,000 feet for the Keyham Dock, near to Devonport, England. Such contracts as these are the best possible advertisement for our Timber, and it must be fully recognised that not only is the firm of Gray Bros. improving their own position in the Timber trade, but materially assisting the industry of Tasmania generally. The firm have recently improved their plant by putting in more powerful engines, whilst in other respects the whole plant and machinery is kept thoroughly up to date.



MR. K. C. RICHARDSON

(who came to Tasmania on behalf of Messrs. S. Pearson and Son Ltd. and Sir John Jackson Ltd., of London).

The firm have this year (1906) prepared and sent away numerous cargoes of long Hewn Piles for various large contracts in different parts of the world, amongst which being some for the Hull Joint Dock of the North-Eastern and Hull and Barnsley Railways, now under construction by Messrs. S. Pearson and Son, Ltd., of London, and for Marine works in Holland.

MR. K. C. RICHARDSON.

The First Shipment of Tasmanian Hardwood Piles to Great Britain.

The two species of Tasmanian Hardwoods, Blue Gum and Stringy Bark, have enjoyed a reputation in the Eastern Hemisphere for quite 50 years, a regular trade having been carried on with New Zealand, and with all the Australasian colonies, besides occasional shipments still further afield; but it was not until the years 1896-1897 that any considerable trade was opened up with Europe. A few cargoes, chiefly of sawn planks, were despatched to London at the time when the craze for hardwood street-paving was at its height; some of the consignments were utilised for this specific purpose, and some were otherwise employed. About the middle of 1898, Mr. K. C. Richardson, of London, who at that time had considerable business relations with the eminent firm, S. Pearson and Son, contractors for the new National Harbour at Dover, suggested the use of hardwood in the place of Oregon Pine for the huge piles used for the gantries to be erected to carry the 40-ton concrete blocks into position for the formation of the eastern arm, the extension of the Admiralty pier, and, above all, the three-quarter-mile of breakwater. Oregon Pine possessed three disadvantages for this kind of work—the wood, being light in weight, had to be weighted with iron, at great expense and delay, in order to comply with the contract condition that all wood of large sizes should be of sufficient specific gravity to sink in salt water, or, if buoyant, should be weighted with iron. Again, Oregon Pine is short-grained and treacherous, occasionally breaking off short; also, the "Teredo navalis" makes sad inroads into the wood, reducing it almost to honeycomb in very short time. By lucky chance, Mr. H. G. Gray was at the time on a visit to the home country, and Mr. Richardson obtained for him an introduction to Sir Weetman D. Pearson. This gentleman, with his customary promptitude, quickly decided, and in very few days made a contract with Mr. Gray. He gave the necessary instructions to the chief of his marine department, and the barque "Barfod" was chartered to load a trial cargo of Blue Gum and Stringy Bark piles at Hobart. Further, he commissioned Mr. Richardson to accompany Mr. H. G. Gray to Tasmania, to superintend the selection and shipment. The negotiations were completed in a few days, and early in 1899 the "Barfod" sailed from Hobart with the first cargo of piles, the shortest one being 89ft. 6in. in length, ranging up to 108ft., all 18in. x 18in. square. When it is remembered that this was an experimental shipment—such a cargo of hardwood never having been previously sent on a voyage of 13,000 miles—it may be reckoned a record achievement. Many difficulties had to be overcome. The vessel was chartered to load at Hobart, and the master refusing to load at any other place, it was necessary to bring the piles, weighing each from six to eight tons, from such far-away places as Adventure Bay (35 miles), Port Arthur (50 miles), etc., up to Hobart. A good-sized ketch could not bring more then two at a time, one slung on each side. The logs were landed by crane at Constitution Dock, then carted round by means of "jinkers" to New Wharf, to the "Barfod," then put on to hopper punts (kindly lent by the Hobart Marine Board), in order to render shipment possible through the vessel's bow-ports. In order to lessen the excessive cost and delay, Mr. Richardson subsequently brought his formerly acquired West Indian experience to bear. To acquire buoyancy, empty whale oil casks were hired and bridled, the logs were made fast to them, and the steamers "Warrentinna" and "Ivy" were requisitioned to tow them. It was a unique sight on one occasion to see the "Warrentinna" steaming slowly up the Derwent, having in her wake eight huge logs—two abreast. She presented the appearance of towing an enormous sea-serpent, 500ft. in length! Experiments are, proverbially, costly; the expense of so much handling threatened to kill the new industry; consequently, vessels are now chartered to load at various outports in the vicinity of Hobart. Very little trouble is experienced in thus arranging, for Southern Tasmania abounds in well-sheltered, deep-water bays and harbours. The employment of steam launches and specially constructed loading punts now enable Messrs. Gray Bros. to supply piles of almost any size, ranging up to 120 feet in length, if required. This experimental cargo to Dover was so far successful that Messrs. Pearson & Son gave Messrs. Gray Bros. an order to prepare four more cargoes, which were duly shipped, the selection of same being entrusted to Mr. W. H. Heyn, who attends to the timber department at Dover, a gentleman well known as an experienced timber expert.

MR. W. HEYN

(Head of the Timber Department, Messrs. S. Pearson and Son Ltd., Dover, Eng.).

The Dover business has proved an excellent advertisement for Tasmanian woods for engineering purposes, and has enabled Mr. Richardson to obtain contracts for piles for South Africa, and for Keyham (England), on account of Sir John Jackson. At the time of publishing this book he is again in Tasmania, attending to the shipment of several cargoes of piles, etc., to the United Kingdom.

Mr. Richardson (whose photograph we insert) is an acknowledged expert on West Indian, American, and Colonial Woods, and has on various occasions read valuable papers before the Royal Society of London, and other Public Bodies, which have been highly thought of. While in London, he published, this year, a pamphlet on "The Tasmanian Timbers, Blue Gum and Stringy Bark, for Engineering Purposes," which has been the means of bringing these Hardwoods more prominently before the notice of the English trade.

All the above-mentioned business we have referred to was entrusted to our firm, and carried out by us to the greatest satisfaction of the eminent contracting firms for these large Marine Works. The success of these shipments made by us has been the means of bringing about an increased demand for our Piles in other similar works in the United Kingdom and on the Continent, thus enabling our Firm this year (1906) to secure further Contracts to supply several cargoes to the extent of 5½ million superficial feet.

MR. W. H. HEYN.

We insert a photograph of this gentleman, who is the head of the Timber Department of Messrs. Pearson and Son Ltd., of London, the Contractors for the Admiralty Harbour Works at Dover, on the English Channel. Mr. Heyn, who is well-known as having great experience of Baltic and American Timbers, and is an acknowledged expert on the subject, was out in Tasmania during 1900-1901, on behalf of his firm, to superintend the selection and inspection of the Piles required for the above great Harbour Works. While in Hobart, at the special request of the Tasmanian Ministry, he read most important and valuable papers on "Forestry," and "The Present and Future Prospects of Timber in Tasmania," before the Royal Society of Tasmania, which were afterwards printed by the Government for circulation in the State; and in another part of this book we have given an extract from the latter paper, for the information of those interested. While here, he was highly impressed with the wonderful properties of Tasmanian Timber, but sadly deplored the great waste he saw in the Forests, caused through bush fires and useless ringbarking, etc. He very much praised the work of the Tasmanian Axemen, whom he declared to be amongst the finest in the world, as proved by the splendid workmanship displayed in the squaring of the Dover piles.

EUCALYPTUS GLOBULUS.

(Labillardiere.)

Locally named.—BLUE GUM.

HABITAT.—Confined chiefly to the southern part of the Island, over which it is fairly well distributed.

SIZE OF TREES.—Length of trunk, 120ft.; diameter, 2ft. to 6ft.

STRENGTH. $S = \frac{LW}{4\ Bd2}$, 3,500.

WEIGHT PER CUBIC FOOT.—Average 60lb. (seasoned).
„ „ 75lb. (green).

DESCRIPTION AND USES.

This Hardwood is nearly double as strong as English Oak, and may be used for any work for which Oak is used advantageously, being of an imperishable character, very durable in air, ground, and water. The colour of the wood varies from straw to madder brown, the texture is dense, and the grain frequently twisted and curled. Some such pieces are very beautiful when polished. It seasons well, but requires care, and takes a high polish. The wood is very solid and tenacious, and contains a resinous substance, which renders it very suitable for use in sea water, as it will resist the Teredo-worm. Good Piles can be obtained up to 120 feet in length, with only a moderate taper, and they stand most remarkably well in water; its high specific gravity makes it an admirable wood for driving in deep water. It is much in use for shipbuilding purposes, and keels have been cut from it over 120 feet in length; also for Wharves, Jetties, Bridges, Decking, Millwright's, and Engineering Work. It is one of the best woods for road paving, railway sleepers, and truck bodies. The grain is often interlocked, so that it makes a good felloe for wheels. It is largely in use for House building purposes, Super-structures, Builders' Scantlings, Joists, Beams, Floorboards, Waggons, Carts, Ploughs, Agricultural Implements, and Tool Handles of all kinds. The young wood is straighter in the grain, and very suitable, and is much used for Cart Shafts, Spokes, Naves, Swingletrees, and anything requiring toughness, spring, and elasticity. This wood when seasoned, makes excellent furniture, beautiful panels, picture-frames, and other articles of utility and ornaments.

EUCALYPTUS OBLIQUA.

(L'Heritier.)

TASMANIAN OAK.

Locally named.—STRINGY BARK.

HABITAT.—Very plentiful, and very widely distributed over the Island.

SIZE OF TREES.—Length of trunk, 120ft.; diameter, 3ft. to 6ft.

STRENGTH. $S = \frac{LW}{4\ Bd2}$, 3,600.

WEIGHT PER CUBIC FOOT.—Average, 57lb. (seasoned).
,, ,, 69lb. (green).

DESCRIPTION AND USES.

An exceedingly durable wood, and, perhaps, the most valuable Hardwood of the Tasmanian Forests, and because of the great variety of its uses and its abundance, is more valuable, economically, than Blue Gum. It much resembles Blue Gum in colour and appearance, but is freer, and not so heavy, of a lighter colour, and varies from a pale straw to a reddish brown. When polished, it very much resembles English Oak, but is handsomer, having a more sparkling grain, and has a very brilliant effect when used for Ballroom floors, or for Wainscoating. It is a strong, tough wood, straight in the grain, similar to English Oak, and takes a good polish, and is used for all purposes. It is considered better than English Oak, the breaking strain is greater, and the wear is everlasting. It is used very extensively for Piles, which are obtained to great length, and last a long time when placed either in the ground or in the water. It is now being used for the same purposes as Blue Gum, and its qualities make it equally as good in soil and water. It has been proved to be a better resister to the attacks of the seaworm than Blue Gum. All the piles used in the extension of the Hobart Wharves were of this timber. It is in general use for Building and Constructive purposes, also for Railway Sleepers, owing to it being very durable in the ground; timbering for Mines, Waggon building, Carts, Vans, Wheelwright's work, and Agricultural implements. When seasoned, it makes beautiful Furniture, especially Bedroom

Suites, Wardrobes, etc., Picture Frames and Mouldings. When cut into Floorboards, it makes the best floors to be had in the Colonies. Laid grain end up it is one of the best timbers for road paving.

ACACIA MELANOXYLON.

(R. Brown.)

Locally named.—BLACKWOOD OR LIGHTWOOD.

HABITAT.—Found all over Tasmania; and in many parts it is plentiful.

SIZE OF TREES.—Length of trunk, 60ft. to 80ft.; diameter, 3ft. to 6ft.

STRENGTH. $S = \frac{LW}{4\ Bd2}.\ 2,744.$

WEIGHT PER CUBIC FOOT.—37 to 40lb. (seasoned).

DESCRIPTION AND USES.

This timber is the most handsome and valuable of the Tasmanian fine-grained woods for Cabinet and Decorative purposes, and is in much demand. Immense quantities of it have been exported to the Australian States during the past fifty years, and to Great Britain. Many of the logs, more especially butt logs, show beautiful figure markings in the grain of the wood. These are termed "Fiddle back" or "Silver Grain" Blackwood. Such logs always bring a high price in the market. The wood is of a dark reddish colour, some logs being very finely mottled. It works well under tools, or in the lathe. It takes a brilliant polish, and gives an effect quite equal to Walnut, which it also somewhat resembles. It seasons well, losing weight considerably. It is considered quite equal to Mahogany, and is largely used for Shop Fittings, Counters, Wainscoting, Furniture-making, such as Tables, Bookcases, Sideboards, Wardrobes, Hall-stands, etc., Pulpits, Decorative work, the finer descriptions of Cabinet manufacture, and interior fittings generally. It is also a good wood for Cooperage work, Staves for Casks, etc., and its soundness and durability is beyond question. The figured timber is much used by Piano and Billiard Table Manufacturers, and for Railway Carriages and Saloon fittings, for which purpose it is admirably adapted. It makes beautiful gun-stocks and walking-sticks, and is extensively used in all sorts of Turnery and Marquetry work. There are several varieties of this figured wood.

"Bird's-eye" is often very beautifully figured in pen-like patterns; the colour is brownish, closely streaked, with various shades of red, bearing light golden markings. The striped variety, or "Fiddle pattern," so-called from the resemblance of its barred and mottled surface to that of the back of a violin, is made into walking-sticks and various table ornaments. Another variety of the same species is "Lightwood, or Pencil wood." The colour of this is much lighter than Blackwood proper, varying from straw to light brown. It is a plain wood, more open in the grain than the other varieties; works well, and polishes well. It somewhat resembles common Mahogany, and is admirable for Cabinet-work.

These varieties of figured wood are exceedingly beautiful; the effect in artistic panelling, and the best of Cabinet-maker's work, being highly pleasing.

Blackwood is now in common use in the English Arsenals for the construction of gun-carriages, our firm having supplied the War Department with large quantities of this wood, a purpose for which it has proved eminently satisfactory, after having been put to the severest tests.

Sold in Logs, from 10 to 25 feet long, and from 2 to 3 feet diameter, also in flitches.

DACRYDIUM FRANKLINII.

(Hooker.)

Locally named.—HUON PINE.

HABITAT.—Found only in the south and south-west portion of the State.

SIZE OF TREES.—Length of trunk, 30ft.; diameter, 2ft. to 6ft.

STRENGTH. $S = \frac{LW}{4 Bd^2}$, 1,218.

WEIGHT PER CUBIC FOOT.—33lb. (seasoned).

DESCRIPTION AND USES.

This timber is the grandest and most useful of our Tasmanian Soft Woods, and there is no more durable wood in the world. It is practically indestructible in water, and almost everlasting in any situation, withstanding the attacks of worms and insects.

It is far superior to any of the imported Pinewoods, and is a most valuable wood, which has been commonly spoken of by expert authorities as being absolutely one of the best woods in the world. It is a sound, straight-grained, mild-working wood, of a bright yellow straw colour, and very full of an essential oil, which causes it to be almost rot-proof. For boat-building purposes it cannot be surpassed, and placed in contact with either the water or the ground, it is almost indestructible, and its life may be said to be almost interminable. It is exceptionally free from the attack of the Teredo worm, possibly owing to its strong resinous nature, and probably for the same reason it is singularly free from the ravages of the many forms of borer that are so destructive to almost all woods. It is a very easily worked wood, steams and bends well; good under any kind of tool, and excellent in the lathe. It seasons well, and takes a high polish, and is much used for first-class Joinery, Railway Rolling-stock, Tramcars, Cabinet work, Furniture making, very beautiful Bedroom suites, Household fittings, and all kinds of Ornamental work. It is the foundation of most Tasmanian Marquetry work.

It is in great demand throughout the Australian States for ship's decks, planking, and boat building generally. The supply now is getting little more than sufficient for the local demand.

There are two varieties of this timber, one a plain, bright straw colour, the other a "Bird's-eye" pattern, the grain of which is curiously curled and spotted, resembling Maple, and from which very beautiful figured panels can be cut, up to 3 feet in width. This figured timber fetches very high prices.

Average size, sold in logs, from 10 to 20 feet long, and 3 feet diameter.

MYRTLE.

(Fagus Cunninghami.)

HABITAT.—Fairly well distributed throughout Tasmania; plentiful in the western and north-western districts.

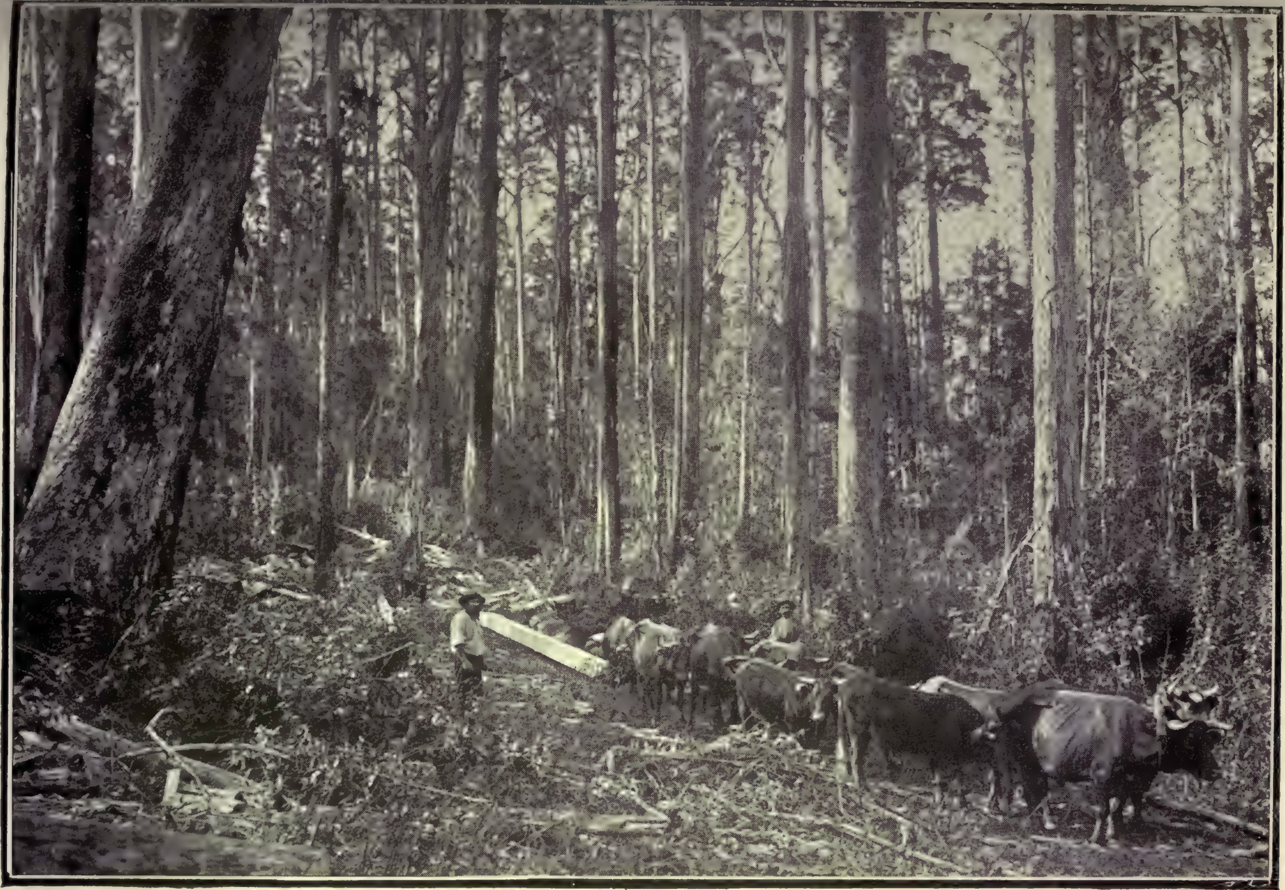
SIZE OF TREES.—Length of trunk, 40ft.; diameter, 2ft. to 4ft.

STRENGTH. $S = \frac{LW}{4\ Bd2}$, 2,804.

WEIGHT PER CUBIC FOOT.—Average, 39lb. to 54lb. (seasoned).

DESCRIPTION AND USES.

This Timber is as strong as the English Oak, and it is one of the best of our Cabinet and Decorative Woods. It



GRAY BROS. Hauling Piles through the Forest to Shipping Place, Adventure Bay, Southern Tasmania.

has been favourably reported upon by English experts, both for strength and the high finish it takes; is of a dark pink colour when freshly cut, fading to a lighter shade with brownish tint, and is a timber that stands traffic well, acquiring a smooth surface, which does not shred or tear away. There is another variety, which is white and soft. Myrtle makes splendid felloes, staves for tight casks, saddle-trees, gun-stocks, and all sorts of turnery, skirtings, and dados. It is also used for tramway rails, bodies of carriages and trucks. For ballroom and other floors, where there is great traffic, it is exceedingly durable, and gives a beautiful surface. The pinker tints make handsome Furniture, Panels, Walking-sticks, and Ornamental work. The wood has a beautiful surface when dressed, and takes an admirable polish, showing a good lustre, being singularly free from knots and faults. It is now used in the Piano trade for inside work, for veneering on. The cost of this wood is about the same as Blackwood.

Sold in Logs, from 10 to 25 feet long, and from 2 to 3 feet diameter.

FOREIGN EXPORTS OF TIMBER FROM TASMANIA.

(To Ports outside the Commonwealth of Australia.)

Year.	Value.
1902	£12,781
1903	24,628
1904	46,664
1905	53,094

(The value of timber exported as fruit cases not included.)

IMPORTS OF FOREIGN TIMBER INTO TASMANIA.

(From Ports outside the Commonwealth of Australia.)

Year.	Value.
1902	£1,541
1903	11,358
1904	18,135
1905	9,628

(Represents the value mostly of Pine shipments from New Zealand, the Baltic, and American ports.)

TOTAL IMPORTS OF FOREIGN TIMBER INTO THE AUSTRALIAN COMMONWEALTH FOR YEAR 1905.

			Value.
DRESSED TIMBER (Mostly T. & G. Pine Flooring)—			
From United Kingdom ...	14,694 ft.		
" Norway	...33,084,662 "		
" Sweden	... 2,515,987 "		
" United States...	... 2,411,998 "		
		38,027,341 ft.	£264,836
ROUGH OREGON (12 x 6 and over)—			
From Canada	... 2,446,706 ft.		
" East Africa	2,000 "		
" United States...	...38,652,058 "		
		41,100,764 ft.	£118,177
MIXED ROUGH TIMBERS—			
From Canada	...11,230,280 ft.		
" United States...	...36,867,197 "		
" Sweden	... 3,077,756 "		
" Norway	... 1,872,950 "		
" Russia	... 1,647,700 "		
" 10 other Countries...	2,277,629 "		
		56,973,512 ft.	£299,450
		136,101,617 "	£682,463
LATHS, PICKETS, LOGS, ETC.—		25,000,000 "	£60,400
From New Zealand		65,690,000 "	£329,658
		226,791,617 ft.	£1,072,521

LIST OF TASMANIAN EUCALYPTI TIMBER TREES—(A. O. Green).

Local Name.	Family.	Species.	Length and Diameter of Trunk.	Strength. $S. = \frac{L\ W}{4\ bd^2}$	Specific Gravity. Well Seasoned.	Well Seasoned Samples. Weight per Cubic ft. lbs.	Remarks as to use, etc.
GUM, BLUE - - -	Myrtaceæ	Eucalyptus Globulus	120ft. x 2ft. to 6ft.	2000-2500	·84-1·09	52-68	Piles, Sleepers, Paving Blocks, Buildings, Railways, Bridges, Furniture, etc. Plentiful.
,, CIDER - - -	,,	,, Gunnii	20ft. x 2ft.	2400	·700	44	Inside Work.
,, IRONBARK -	,,	,, Sieberiana	40ft. x 4ft.	2400	·896	55-60	Sleepers, Buildings, Railways, Bridges, Furniture, etc. Plentiful.
,, MUELLER'S -	,,	,, Muelleri	80ft. x 3ft.	3200	1·001	63	Sleepers, Buildings, Railways, Bridges, Furniture, etc. Plentiful.
,, PEPPERMINT -	,,	,, Amygdalina	100ft. x 3ft. to 6ft.	2600	·75-1·039	46-65	Sleepers, Paving Blocks, Buildings, Railways, Bridges, Furniture, etc. Plentiful.
,, RED - - -	,,	,, Stuartiana ? Acervula	60ft. x 3ft.	2260	1·052	66	Sleepers, Paving Blocks, Buildings, Railways, Bridges, Furniture, etc. Plentiful.
,, STRINGY BARK	,,	,, Obliqua	120ft. x 3ft. to 6ft.	1800-3600	·77-1·05	48-66	Piles, Sleepers, Paving Blocks. Most durable, suitable for all purposes. Plentiful.
,, TOPPED STRINGY BARK	,,	,, Hæmastoma Amygdalina var.	100ft. x 3ft. to 4ft.	1500-2400	·776·8	48-51	Suitable for Sleepers, Carpenters, Joiners, House Fittings, Floors, etc. Plentiful.
,, SWAMP - -	,,	,, Regnans	100ft. x 3ft. to 8ft.	1400-3000	·776-·85	48-54	Plentiful. Very strong wood for Inside Work.
,, WEEPING - -	,,	,, Coriacea Pauciflora	10ft. x 2ft.	—	—	—	Common. Carpentry and Fencing.
WHITE - -	,,	,, Viminalis	80ft. x 3ft. to 6ft.	1646 1788	·7-·76	44-48	For Carpenters, Joiners, House Fittings, Floors, etc. Plentiful.

List of other Tasmanian Timber Trees.

Local Name. Remarks as to use, etc.

MYRTLE.—General carpentry, cooper's work, furniture. Two varieties, red and white. Plentiful.

BIRCH.—Turnery, inlaying, etc. Common.

BLACK WATTLE.—Ornamental wood, with variety of colours. Common.

BLACKWOOD.—A handsome joiner's and cabinet-maker's wood. Common.

BOOBYALLA.—Tough, suitable for wooden hoops, etc. Common on coast.

BOX, NATIVE.—Turners. Engraving blocks, etc. Common.

BULL-OAK.—Cabinetmakers' and ornamental work; bold figure. Common.

COTTONWOOD.—Mathematical instruments, cabinet and turner's work. Common in north.

HONEYSUCKLE.—Cabinetmakers' and ornamental work. Common.

HORIZONTAL.—A tough elastic wood for implements, tools, etc. Common.

IRONWOOD.—Pulleys and bearing blocks, similar to lignum vitæ. Common N.E.

LABURNUM.—Turnery and inlaying.

LANCEWOOD.—Turnery and implements. Common.

LAUREL, NATIVE.—Ornamental work.

LEATHERWOOD.—A light, tough, and elastic wood for implements, etc. Common West Coast.

MINT-TREE.—Ornamental work.

MUSK.—Handsome wood, for joiner's and cabinet-work. Common.

NATIVE CHERRY.—A red-brown wood for cabinet-work. Common.

NATIVE CURRANT.—Turnery and tools; handsome grain. Common.

NATIVE PEAR.—Turnery, etc.

NATIVE PEPPER.—Common North and West.

PINE, CELERY-TOPPED.—A dense, strong pine; general carpentry. Common N. and W.

PINE, HUON.—Durable pine, often handsomely figured. Common W. Coast.

PINE, KING WILLIAM. — Extremely light, strong, straight-grained. Common W. Coast.

PINE, OYSTER BAY. — A strong pine for framing, poles, etc.; very durable. Local, East Coast.

PINKWOOD.—Tools, turnery, etc.

PRICKLY MIMOSA.—Ornamental and implements.

SASSAFRAS.—Plain, light-coloured, good for carving if felled in the winter. Common.

SCENTWOOD.—A sweet-scented wood for sachets, etc. Local, North Coast.

SHE-OAK.—A handsome, ornamental wood for cabinet-work. Common.

SILVER WATTLE. — Straight-grained, elastic wood, of general utility. Common.

TALLOW-WOOD.—Engravers, etc.

TEA-TREE.—A tough wood for implements, tools, etc. Common.

WHITE WARATAH.—Turnery and inlaying.

WHITEWOOD.—Turnery and inlaying.

Reports on the Durability of the Eucalypti Hardwood Timbers of Tasmania, FOR VARIOUS PURPOSES.

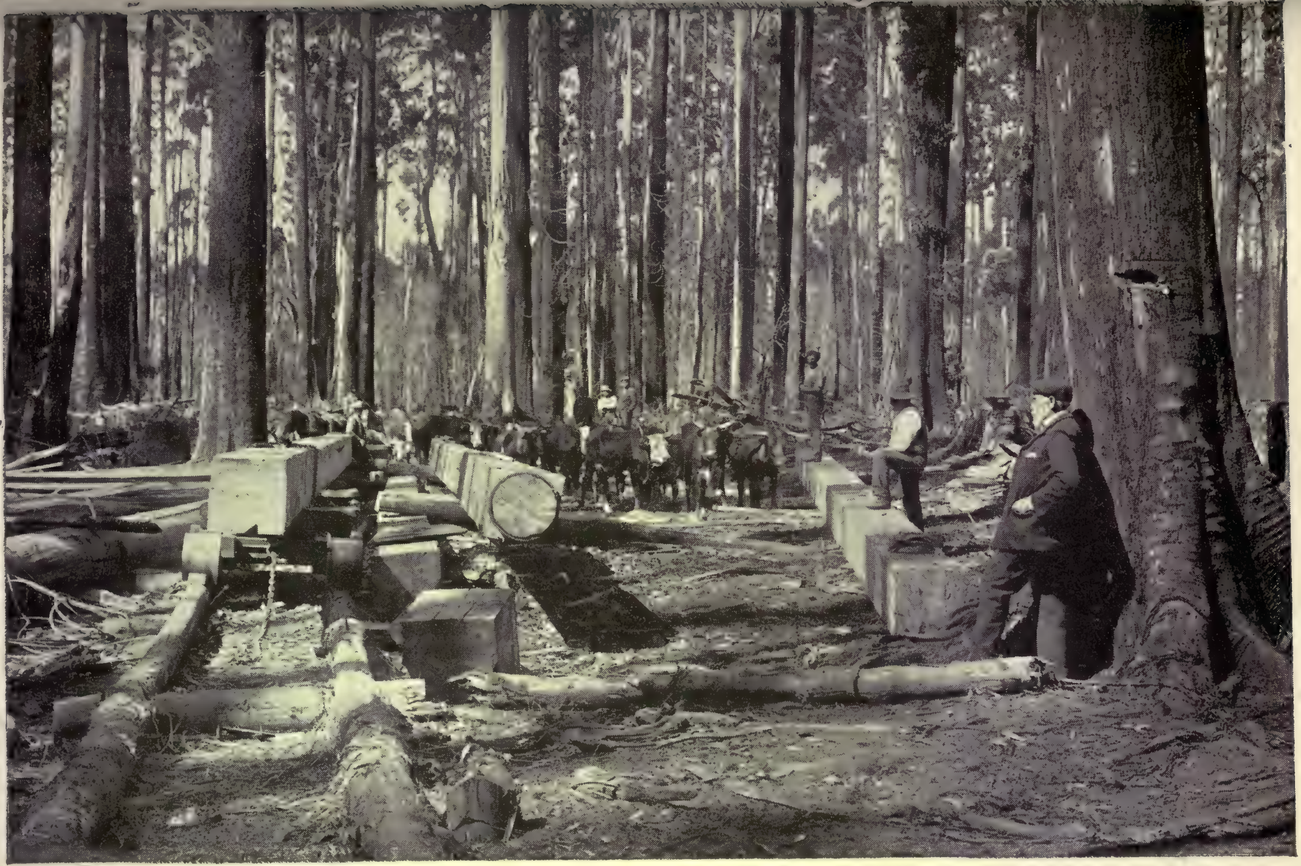
RE THE TASMANIAN BLUE GUM—AN IDEAL TIMBER FOR HARBOUR BUILDING.

(By HAROLD J. SHEPSTONE.)

Extract from an article in the "Scientific American" of 21st January, 1905:—

The erection of the great National Harbour, at Dover, on the south coast of England, has called attention to the wonderful properties of the Tasmanian Blue Gum (Eucalyptus globulus). It is at once one of the strongest as well as the most durable and densest timber in the world. It is so heavy that it will sink like a piece of lead, while it is also practically immune from the attacks of the seaworm. These facts have only lately been more or less known to timber experts, but the presence of a large number of piles of Tasmanian Blue Gum at Dover, where they were tested together with other timber, has shown in the most striking manner the superiority of this wood for the erection of staging in salt water.

Before dealing further with the wonderful strength and remarkable density of the Blue Gum, it is as well to note that the harbour where this wood is being extensively employed is one of the biggest engineering feats ever undertaken. It is being formed by extending the well-known Admiralty Pier at Dover some 2,000 feet, the erection of an eastern arm 3,320 feet in length, and the building of a breakwater 4,200 feet long. Naturally, the carrying out of such a huge undertaking called for an enormous amount of timber, the minimum quantity required being given as follows:—Hardwoods, principally greenheart and rock elm, 25,000 cubic feet; and softwood, pitch pine, redwood, etc., 75,000 cubic feet for permanent work; and for



GRAY BROS.

Piles Ready for Transport on Tram, Taranna, Southern Tasmania.

merely temporary staging, 550,000 cubic feet of blue gum and other hardwood, and pitch pine, etc., for superstructure, 550,000 cubic feet; or some 1,500,000 cubic feet of timber in all.

It was not necessary, of course, to go to Tasmania for the execution of such an order, so far as quantity was concerned; indeed, some of the timber used for piles at Dover has been imported from Vancouver's Land, and on the whole there has been very little fault to find with it. Then why, one may well ask, did the contractors avail themselves of the services of their timber expert, Mr. W. Heyn, and despatch him on a journey of 14,000 miles to Tasmania, to bring home piles which could have been purchased cheaper in America or Canada? The reasons were many. To secure Oregon piles 100 feet in length and 18 to 20 inches square (the necessary dimensions) was by no means difficult; but Tasmanian Blue Gum piles were preferable, chiefly on account of their greater specific gravity. In the first place, it was found impossible to get a pile of Oregon 100 feet in length into position for driving into the ground through 47 feet of water at low tide, on account of the strength of the tides and currents, unless it was "weighted" with iron at the end. This at once entailed an extra expense in material and labour of nearly 50dol. per log.

But the Blue Gum possessed other advantages over its rival Oregon. The Teredo navalis, or seaworm, literally honeycombing its way through the latter, rendered it, after some time, unfit for further use as a pile. As a rule, the timber was injured through the ravages of this little animal after a period of about eighteen months to two years. Now, it is not difficult to see that as the piles are only employed to carry temporary staging, so as to enable the 40-ton concrete blocks of which the harbour walls are being built to be placed in position, a great saving is effected by using them over and over again as the blocks are laid. That was impossible for any great length of time in the case of Oregon wood, but with Tasmanian Blue Gum it was entirely different. Being immune from the attack of the sea insect, the greater proportion of the Blue Gum piles at Dover have been in constant use for over three years, some having been driven three or four times, and there is no reason why they should not be re-employed in this manner till the whole work is completed. On account of their high gravity, it is not necessary to weight them, and should they get carried away by accident, they would sink where they fell, and could easily be recovered, instead of floating about as Oregon would do, a menace to the works or to ships or steamers. Some idea of the density of this wood may be the better understood when it is stated that it has a specific gravity of 75lb. to the square foot, whereas water is but 65lb. A pile of Blue Gum, therefore, 100 feet long and 20 inches square, would turn the scale at nearly 10 tons, while an Oregon log of similar dimensions, having only a specific gravity of 48lb. per square foot, would only weigh 6 tons, and consequently float.

A large quantity of the timber to be seen at Dover came from the yards of Messrs. Gray Brothers, of Adventure Bay. Mr. Gray, the head of the firm, states that they often come upon trees from which they could cut piles 160 feet long (that is, 60 feet longer than required by the contractors at Dover) before the first branch is reached, and others, 230 feet high, measure 7 feet through at the butt.

The wonderful strength and lasting qualities of the Tasmanian Blue Gum have been more than demonstrated at the Dover Harbour Works, where their employment has given the greatest satisfaction, thus calling attention in the most emphatic manner to the commercial value of Tasmanian timber. Tests, very carefully made, and at long intervals, show that the Tasmanian wood will sustain about double the weight of English oak before breaking, and will even regain its elasticity after bearing a weight at which oak breaks, while as to its longevity under water, no limit appears so far to have been reached.

It is interesting here to note that sleepers cut from the Stringy Bark and Blue Gum are most excellent. They have been used on the Dover Harbour Works for four years, exposed to the most trying weather, salt and fresh water, very heavy traffic of locomotives, goliath cranes, etc., being continually shifted and re-laid as the engineers of the service require, and yet they are in as good condition to-day as they were when first put down. Large quantities of these sleepers are being sent from Hobart to South Africa, where they are highly esteemed. Their great feature is their durability, their average life being no less than twenty years. They cost about 1.50dol. each, against 1dol. for Baltic or soft timber sleepers, which do not last one-third of the time. This wood is also admirably adapted for wood paving, and if properly laid on a good concrete foundation, will last under heavy traffic fifteen to twenty years, and does not polish through use, thus giving a sure foothold for horses.

For much of the above information, the writer has to acknowledge his indebtedness to Mr. W. Heyn, head of the timber department of Messrs. S. Pearson and Son, the contractors for the Admiralty Harbour Works at Dover.

The piles referred to in the above article were supplied by our firm to Messrs. Sir Weetman Pearson and Son Limited, contractors for the Admiralty Harbour Warks, Dover, England, and no traces of the "Teredo Navalis" attacks have been found on them, the contractors being much satisfied with them both on this account, and because of their great durability and high specific gravity.

GRAY BROS.

Old "Mercury" Buildings,
83 Macquarie-street, Hobart, Tasmania.

Marine Board, Hobart, 22nd May, 1905.

RE STRINGY BARK AND BLUE GUM FOR HARBOUR WORKS.

Sir,

After twenty-six years' experience, I have found Stringy Bark to be admirably adapted for piles, some of which have been in the wharves for thirty years, and are in very fair condition.

With regard to Blue Gum, I do not hesitate to say that it will compare favourably with any timber in the world for beams, walings, and decking. Some of this timber has been in the wharves for thirty years, and is as good now as the day it was put there.

I have the honour to be,
Sir,
Your obedient Servant,
W. H. FORSYTH, Foreman of Works.

The Master Warden.

Franklin Chambers, 22nd April, 1902.

The Master Warden Marine Board of Hobart.

RE BLUE GUM AND STRINGY BARK FOR WHARF CONSTRUCTION.

We beg to report as follows:—

The Tasmanian Timbers most abundant and most suitable for such works are the Stringy Bark and Blue Gum. These woods have been used for Wharf construction at Hobart ever since the settlement of the colony with equally good results.

For long piles, beams, walings, braces, etc., we should recommend Stringy Bark; it is of this wood that the recently finished large pier is constructed.

We have never used Muntz metal on piles, neither have we used any arsenical preparation, or driven any with the bark on them, therefore we are not in a position to say what the result would be.

Our usual practice here, and one which has given fairly good results, is to coat the piles with coal tar, then to slightly and evenly char the surface, and whilst the piles are hot from the fire, to again thoroughly saturate the charred surface with extra thick coal tar until no more will soak in.

We have the honour to be,
Your obedient Servants,
(Sgd.) HUCKSON AND HUTCHISON,
Architects to The Marine Board of Hobart.

Marine Board, Hobart, 13th January, 1903.

RE BLUE GUM AND STRINGY BARK FOR WHARVES, BRIDGES, AND OTHER BUILDING PURPOSES.

Sir,

For upwards of thirty years I have had experience in the use of Tasmanian timbers, particularly Blue Gum and Stringy Bark, for wharf-construction in the Port of Hobart, and have found them to be of a most durable character, being well qualified to withstand exposure to all weathers. I find that piles made of either of the timbers just mentioned, if carefully selected and properly treated before driving, will last for twenty-five years; and that beams, planks, etc., of wharves, of the same description of wood, if carefully selected, cut on the quarter, and propertly treated before fixing in position, will last from twenty-five years to thirty years. These periods are fair averages if the work is exposed to the weather; but if the timber is used in works where it would be kept dry, it would last much longer.

I have taken timber from the Hobart wharves, as specified below, and found it to be in good order and still serviceable:—Market Wharf: From a beam after having been in use thirty-five years. New Wharf: From a beam after having been in use thirty-two years. Elizabeth-street Pier: Part of deck-planking, after having been in use twenty-six years.

I have not gone outside my personal experience in making this report, and can consequently, with confidence, recommend the timbers referred to.

I have the honour to be,
Sir,
Your obedient Servant,
J. AINSLIE, Foreman of Works.

The Master Warden.

Mr. Charles Geddes, of Port Pirie, South Australia, a well-known wharf contractor and timber merchant, of long experience, writes as follows:—

Port Pirie, South Australia, 28th May, 1905.

RE TASMANIAN BLUE GUM AND STRINGY BARK TIMBERS FOR WHARVES AND DECKING.

Dear Sir,

The Tasmanian Blue Gum is a timber that is, in my opinion, preferable to Jarrah for girders, beams, and decking, in both strength and wear. I constructed 500 feet of wharf over nine years ago, and in preference to Jarrah or Karri I chose Tasmanian Blue Gum for crossheads, girders, waling, sheet-piling, and decking to construct the wharf.

This wharf is adjoining a wharf that I have had constructed some four years ago with all sawn timber from Western Australia, and the Western Australian timber used in the decking is so much worn that it will require to be renewed at once, and I have recommended Blue Gum to replace it. I have also recommended the Broken Hill Proprietary Company here to use Blue Gum in preference to W.A. Jarrah, and they have acted on my advice.

About twenty-five years ago there was a mixed cargo arrived here of Blue Gum and Stringy Bark. It was used for building sheds; and about ten years ago I removed these sheds, and found that the Blue Gum posts were perfectly sound underground, but the Stringy Bark was badly decayed and could not be used again; but the Blue Gum posts were all used again, and are in the building to-day.

The only objection I have to Blue Gum is that the sawmillers do not exercise sufficient care in cutting; it is not evenly cut, neither is the heart cut out in many instances. Some of it is ½-inch, and indeed I have noticed it ⅝-inch, undersize, and for Government work the Inspector rejects it. W.A. timber is very evenly cut, and always full size.

In conclusion, if care is exercised in cutting, as above described, I would recommend your Blue Gum timber before W.A. timber; and to prove what I say, and to show you the confidence I have in your Blue Gum, I have recommended a friend of mine, who is about to construct a new wharf here, to send the order for all the timber, piles included, to be of Blue Gum.

Yours faithfully,
CHARLES GEDDES.

E. A. Counsel, Esq., Secretary for Lands, Hobart.

RE BLUE GUM FOR WHARF DECKING.

From Hobart "Mercury," 26th September, 1905.

After twenty years' experience of our local timber and West Australian Jarrah and Karri, the Melbourne Harbour Trust Commissioners are satisfied that Tasmanian Blue Gum easily leads for wharf purposes, and, as a result, have given an order for a quarter of a million feet of Blue Gum for decking. The timber will be sent across to Melbourne in ketches. The Commissioners are anxious that the timber should have the Government brand, and have consented to pay for the inspection.

RE BLUE GUM PILES FOR HARBOUR PURPOSES.

In a report "On Eucalyptus Cultivated in the U.S.," issued by the U.S. Department of Agriculture, 1902, as an illustration of the use of Blue Gum Piles for Harbour purposes, the report states that a contractor who was constructing a pier at Oceanside (California), required a few piles of Oregon timber to complete his contract. As these were not for the moment to be had, he obtained from a neighbouring plantation some Piles of Blue Gum. When it became neecssary, some years later, to repair the pier, these were found to be the only sound piles in the structure. The demand for these Piles, the report states, is now greater than the groves of Eucalyptus can supply.

RE BLUE GUM AND STRINGY BARK TIMBER FOR PILES.

Hobart, 27th April, 1905.

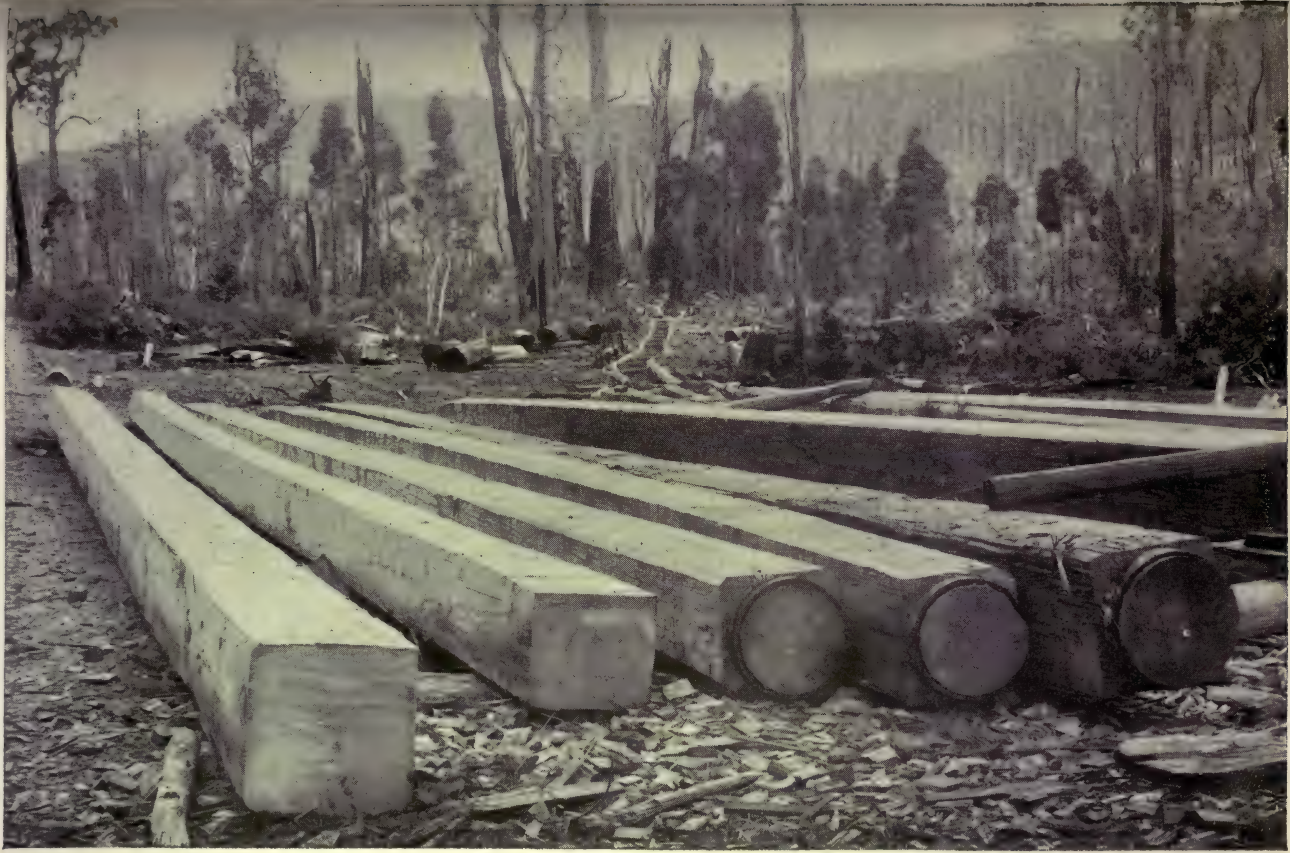
Messrs. Gray Bros.,
Sawmillers and Timber Exporters,
Macquarie-street,
Hobart.

Dear Sirs,

In reply to your inquiry as to the relative merits of Blue Gum and Stringy Bark Timber for Piles, I beg to state, the lasting qualities or "life" against the sea worm, Stringy Bark, so far, is proved to be the greatest resister, although Blue Gum in other respects, having more density, or weight, is not so liable to burr, or split in driving, and is often taken in preference.

Yours, respectfully,

(Signed) CHAS. DEARDEN,
Govt. Timber Expert.



GRAY BROS.

Piles Ready for Transport, Tasman Peninsula, Southern Tasmania.

RE TASMANIAN TIMBER FOR RAILWAY AND GENERAL CONSTRUCTIVE WORKS.

Engineer-in-Chief's Office,
Department of Public Works,
Hobart, 10th January, 1903.

Memorandum for
The Honourable the Premier.

Eu. globulus, Blue Gum; Eu. obliqua, Stringy Bark.

Sir,

In reference to our interview of yesterday, I have the honour to inform you that native grown Blue Gum and Stringy Bark have been used from the earliest times to the present for general constructive works of this State with satisfactory results.

With regard to sleepers, experience has shown that the average life in the road over the whole of the Railways is about 14 and 15 years. In this connection I may state that the ballast is gravel, and the rainfall in the different parts of this State varies from 20 to 60 inches per annum.

You will understand that when speaking of the average, that in order to make this average, a large proportion of the sleepers must last very much longer than the time mentioned. Sleepers have been taken out of the road for the purpose of exhibition after they have been 25 years under traffic, and still fit for work. The wood is hard, so that bed-plates are not required under the rails of the vignoles section of rail, which is the standard used.

The holding for the spikes is good; the practice being to bore right through the sleeper with a ½-inch nominal measurement bit for nine-sixteenth square spike.

With regard to Bridges. The Bridgewater Bridge on the Main Road leading from the Capital City northwards is 1,010 feet in length, many of the piles being from 70 to 100 feet long, 40 to 60 feet of driving, divided into 22 bays of 22 feet span, was built at a cost of £7,580, and opened for traffic in April, 1849. It was closed for traffic in the latter part of 1896, having had a long life, and when it was dismantled in 1899 a considerable proportion of the timber was sound. This Bridge is in tidal water, and the trade is fairly abundant.

Another Bridge on the Main Road from the Capital, leading westward over the Huon River, of six 80 feet spans, built 27 years ago, was recently inspected throughout, with the result that the piles were found to be as good as when driven, and the beams generally sound throughout, and quite safe for a considerable time to come. The loads on this Bridge are up to 13 tons.

I send with this a Pamphlet on Tasmanian Timbers, written by Mr. Green, of this Department, with the pages 13 and 15 marked as you request; also the proceedings of the Royal Society for 1900 and 1901, containing a paper read by Mr. W. Heyn, of the Admiralty Harbour Works, Dover, England, who was here in 1901 to procure timber for the Dover works. I have turned down the pages and marked several passages which will carry weight, as being the opinion of a thoroughly qualified and disinterested authority.

Unless you particularly desire to keep the papers, I shall be glad to have them again.

I have the honour to be,
Sir,
Your obedient servant,
(Sgd.) J. McCORMICK,
Engineer-in-Chief.

Tasmanian Government Railways,
Engineer of Existing Lines' Office,
Hobart, 6th February, 1905.

FURTHER NOTES ON TASMANIAN HARDWOOD SLEEPERS.

Sir,

In reply to the request that I should furnish some further information on the durability and character of our sleepers, it must be understood that all previous reports were based upon the experience gained under the conditions which prevail in this State as regards their use. If, as is now suggested, a more exacting specification as to growth, size of tree, and species of timber can be enforced, then the life of Blue Gum could be increased to at least fifteen years, and Stringy Bark fourteen years; and if, in addition, they are used on lines that do not present the heavy character of sharp curves and severe grades found here, then their life might still further be extended, as here we have numbers of sleepers that have been in use for from twenty to twenty-five years, and are still serviceable.

Bearing or sole-plates have never been in use here, though their use would undoubtedly assist in preserving the sleepers, especially on the sharp curves.

Splits or sun-cracks that arise whilst seasoning are characteristic of the timber, are always present in a more or less degree, and are not detrimental to its use,except in occasional cases in timber cut out of straight-grain and free-grown trees. If they extend through the depth of the sleeper, and in a straight line along a considerable portion of the length, the sleepers are rejected.

The splitting of a sleeper through the driving of dog-spikes is of rare occurrence, and the 9/16in. spike driven in a ½-in. hole holds very firmly, and seldom becomes loose while the sleeper is in fair condition.

Both sawn and hewn sleepers are equally acceptable. Most of those that have been used on these lines in recent years are of the latter quality, partly on account of there being small beds of good timber within access of the lines at various points, where it would not pay to erect a mill, but which finds employment for a number of occupiers of small holdings. They may be either cut on the quarter or "backed off." The presence of a little wane on the edge, thereby slightly reducing the dimensions, should not be a cause for rejection, as the sleeper, if cut out of a fair-sized log, will be of the best quality. Gum-veins, where they occur in short lengths and broken, are not defects; but when they are the full depth and extend for some distance in an unbroken line along the length, the sleeper should not be accepted as first-class. Gum blotches occasionally occur, but do not affect durability.

As regards covering the ends with grease or other material, it is desirable that the Inspector should see the sleepers as they come from the saw; they might then be covered at the ends with advantage, and stacked so as to permit a current of air through.

Especial care should be taken to reject all sleepers that show any sign of heart, which decays rapidly and so destroys the good surrounding wood.

If sleepers for export are to be cut throughout the year, it is desirable that the trees be ringed about six months before the timber is cut and sent to the mill. The months for cutting sleepers for our lines extend from 1st April to 30th September.

I have the honour to be,
Sir,
Your obedient Servant,
C. C. NAIRN, Engineer of Existing Lines.

To the Hon. Alec. Hean,
Minister of Railways, Hobart, Tasmania.

The Hobart Electric Tramway Company, Limited,
Lower Macquarie-street,
Hobart, June 22, 1905.

Messrs. Gray Bros.,
Hobart.

RE BLUE GUM AND STRINGY BARK SLEEPERS FOR TRAMLINES.

Dear Sir,

In response to your request for my opinion as to the durability of Tasmanian Blue Gum and Stringy Bark timbers for sleepers, I have pleasure in stating that I acceded to a similar requisition from the then Premier, Sir Elliott Lewis, in January, 1902, when I informed him that experience had proved to me that they are unsurpassable for the purpose. The Blue Gum is preferable; but, given fair conditions, the other variety has a life of at least 12 to 14 years, especially when covered, as, for instance, when laid in streets for tram and other purposes.

I have recently taken up sleepers which have been in use on our Sandy Bay route for about fifteen years, and the vast majority are as sound as when put down, and I should be pleased to cut one for you at any time for inspection. Given proper selection and seasoning, the Tasmanian sleepers will compare well with any.

Yours faithfully,
A. C. PARKER,
General Manager.

RE BLUE GUM FOR RAILWAY SLEEPERS.

Some of the sleepers laid on the Geelong-Ballarat Railway Line (Victoria) were of Blue Gum, and have only recently (1905) been replaced after being in that permanent way for 40 years.

RE STRINGY BARK (EUCALYPTUS OBLIQUA) FOR SLEEPERS, BRIDGES, AND BUILDINGS.

In the Tasmanian International Exhibition, held in Hobart in 1894, a Stringy Bark sleeper was shown by the Government that had been 25 years under traffic. The usual life of this timber in bridges is from 20 to 25 years. Sleepers average about 14 years; and none of the Government Railway buildings—some of which were built 27 years ago, chiefly of this Timber—have yet been renewed.

Tasmanian Government Railways,
Chief Mechanical Engineer's Office,
Launceston, 22nd May, 1905.

TASMANIAN TIMBERS FOR RAILWAY CARRIAGE-BUILDING.

Memorandum for General Manager, Hobart.

The following native timbers are almost exclusively used in the building and maintenance of rolling-stock; viz.:—Blackwood, Celery-top Pine, King William Pine, Huon Pine, Red and White Myrtle.

Blackwood. — This is a useful timber for all purposes, but chiefly so for carriage superstructure and internal fittings, and is used for all purposes where Teak and Mahogany were previously used. It requires to be thoroughly seasoned for carriage work.

Celery-top Pine.—This timber is used for the underframes, floors, and sides of waggons, and for carriage footboards, and for all purposes where wearing qualities and durability are requisite. It has splendid wearing qualities, and is very durable, and remarkable for the small amount of shrinkage that takes place during seasoning. The shrinkage is so slight that it can be built into waggons direct from the log.

King William Pine.—This is a very light and useful timber. It is used for seat and back-framing, for upholstering work, and outside panelling of carriage bodies, and for any purposes where a light and durable timber is required.

Huon Pine.—This pine has a very fine and clear texture and remarkable durability, and is used for internal panelling and roofing of carriages, and for any part of rolling-stock exposed to severe weather conditions, such as clere stories of railway carriages and gutter mouldings round same; it is also largely used in the construction and repair of waggons, but for the latter purpose Celery-top Pine is now being substituted, owing to it being less costly at present market rates.

Red and White Myrtle.—These are excellent timbers, and are principally used for all kinds of turnery, such as curtain-rings, lamp-rings, etc.; also for axle-box dust-guards, and for internal fittings of carriages.

WM. R. DEEBLE, M. Inst. Mech. E.,
Chief Mechanical Engineer.

REPORT ON VALUE OF TIMBER FOR MINING PURPOSES.

1. BLUE GUM.—This timber, for elasticity, strength, and durability, should perhaps occupy the foremost place on the list, but, as it belongs almost exclusively to the southern portion of the State, it is not readily obtainable for use in the principal mining localities, and is, therefore, but seldom used, excepting for large shaft-frame timbering, pump-stays, pit-head pulley-beams, etc.

2. STRINGY-BARK.—Of this, the brown-barked variety (the true species of Eucalyptus obliqua) is a most durable timber, with a co-efficient of strength next to Blue Gum. Its shrinkage is moderate when being seasoned, but there is a tendency to twist and to camber if care be not taken in the process. I have found it a most suitable timber for mining purposes. The Gum-topped Stringy-bark is good splitting timber, but is softer, shrinks more, and is less durable than the brown-barked variety.

3. PEPPERMINT.—This is a timber largely used in the mines of the northern and eastern divisions for props, legs, caps, etc. It is a most durable kind, but has not so high a co-efficient of strength as the two first-named when used in the round or as spar timbers; and where the crushing-weight is not excessive, it can be depended upon to give good service, and seems less liable to be affected by high temperatures or bad ventilation than the other kinds under review.

M. J. GRIFFIN, Inspector of Mines.

Launceston, 3rd April, 1905.

Marine Board, Hobart,
13th January, 1903.

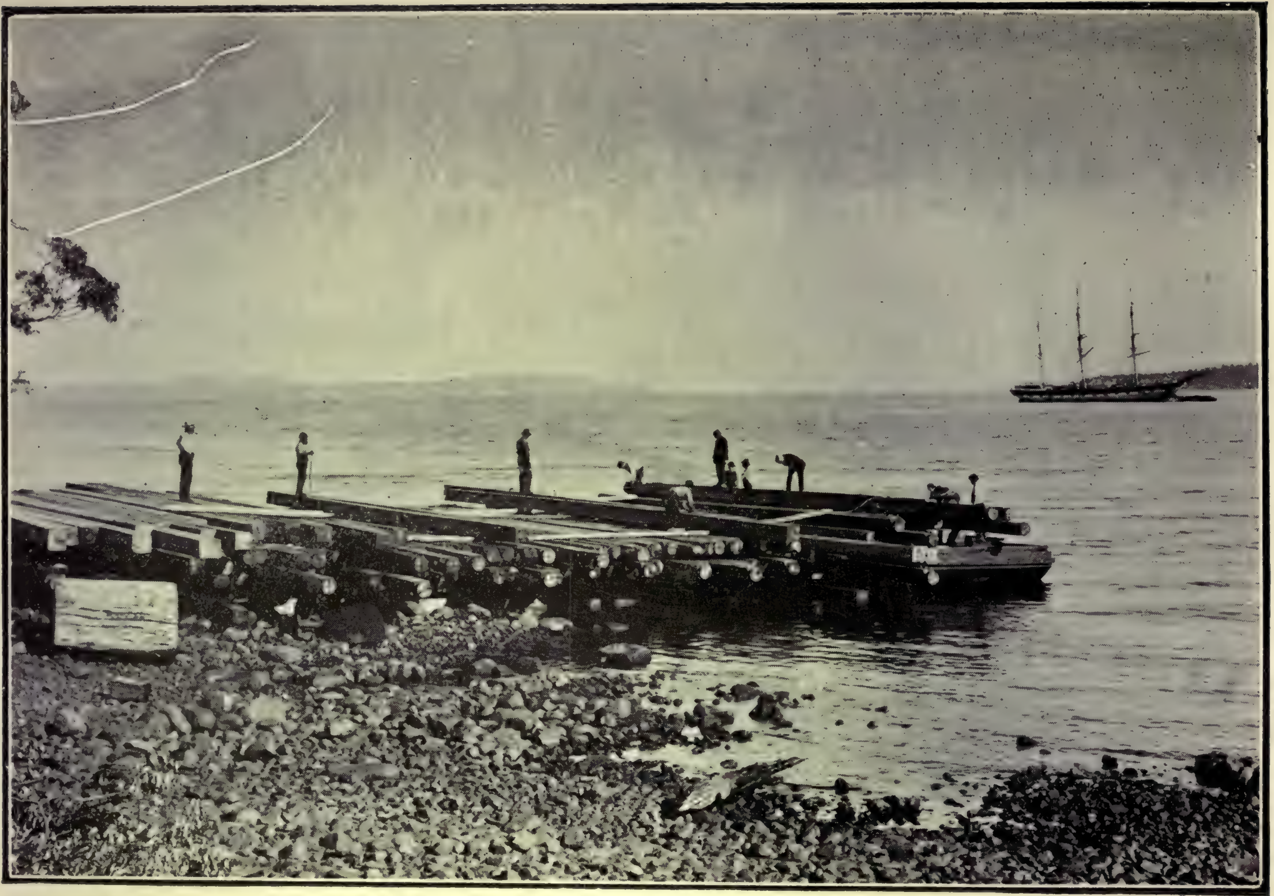
RE TASMANIAN TIMBER FOR ROADMAKING AND OTHER PURPOSES.

Sir,

For upwards of 30 years I have had experience in the use of Tasmanian timber, particularly Blue Gum and Stringy Bark. Opposite the Watermen's Ferry there is a patch of road that was laid eight (8) years ago, and is now in good order, and as sound as the day it was laid.

I have the honour to be, Sir,
Your obedient servant,
(Sgd.) J. AINSLIE,
Foreman of Works.

The Master Warden,
Marine Board, Hobart.



GRAY BROS.

Loading Piles for Shipment to South Africa, at Flinders Bay, Southern Tasmania.

RE TASMANIAN TIMBERS FOR PUBLIC WORKS.

Engineer-in-Chief's Office,
Department of Public Works,
Hobart, 25th March, 1905.

Dear Sir,

In reply to your inquiry, the Tasmanian Blue Gum and Stringy Bark Timbers are the standard timbers for all Government works of every kind; the use of other woods being exceptional, and for special purposes. These hardwoods are both very strong and durable, especially when ordinary care is taken in the selection and felling, and they are treated at all fairly. They may be compared (the Blue Gum especially) to the English Oak.

The Blue Gum is the heavier and stronger, but the Stringy Bark is generally preferred, as being more free in working and more easily obtainable.

I am, Dear Sir,
Yours faithfully,
JAMES FINCHAM, M. Inst. C.E.,
Engineer-in-Chief.

E. A. Counsel, Esq.,
Surveyor-General and Secretary for Lands, Hobart.

RE TASMANIAN TIMBER FOR GENERAL PURPOSES.

Hobart, 10th October, 1906.

Messrs. Gray Brothers, Hobart.

Dear Sirs,—Replying to your inquiry as to the possible expansion of trade in Europe, so far as the utilisation of Tasmanian hardwoods is concerned, I have no hesitation in expressing the opinion that the prospect is encouraging. Up to a comparatively recent date a prejudice existed against them, chiefly for the reason that insufficient care was exercised in preparing the wood for shipment, but experience has evidently taught shippers a salutary lesson, and rigid observance of a few common-sense rules now enables them to supply scantlings sawn free from heartwood, of a description that will compare favourably with the produce of other timber-yielding countries. In view of the increased scarcity and consequent high price of Rock Elm, I have succeeded in persuading some of our eminent English Civil Engineers to substitute Blue Gum. and this wood has given unqualified satisfaction for fenders, rubbing pieces, etc. This same wood is gradually finding favour with waggon builders and wheelwrights, which industries may be reckoned as the most conservative of all. As regards the respective merits of Blue Gum and Stringy Bark for long hewn piles, I have supplied both, and the tests, so far, yield practically the same results. It is, however, of paramount importance that all hewn piles having the heart boxed in the centre be prepared from tres of mature age. Saplings grown on moist and rich soil are unserviceable for the purpose.

Yours faithfully,
K. C. RICHARDSON.

RE BLUE GUM AND STRINGY BARK FOR GENERAL PURPOSES.

Launceston, 20th June, 1905.

Dear Sir,

In compliance with your inquiry of 10th instant re utility of Blue Gum and Stringy Bark for general purposes, I have the honour of submitting the following, from my practical knowledge and experience of Colonial timbers generally for the past thirty-five years:—

Stringy Bark for piles has so far proved the greater resister against teredo, although Blue Gum, having more density, is not as liable to burr or split in driving, and is often taken in preference. Their lasting qualities would be difficult to determine with exactness in sea-water, but from actual data may be taken to have a minimum life of from fifteen to twenty years, while a larger portion would stand without need of renewal some five to ten years longer, and can be driven without any protection or covering. If the same were planted away from the effects of teredo, the maximum might safely take as general life.

As to quality and general usefulness of our Blue Gum in beams, railways sleepers, or any other purposes where strength and durability are required, the timber must of necessity be well selected, free from centre of heart to extent of 5 to 6 inches, also without knots, gum-veins, and other blemishes; these conditions complied with, would ensure standing any test of breaking-strain, durability, etc., almost beyond all other timbers.

I am at a loss to understand engineers and others in their inquiries from our merchants for quotations, specifying that heart will be accepted; thus showing the necessity of making our timbers better known to foreign inquirers, who are more in touch with deciduous grown timbers, where heart-wood is always accepted, and so contrary to the nature of evergreen trees, including Blue Gum and Stringy Bark.

Another important feature in the usefulness of our Stringy Bark, so far not generally known outside of local requirements, is seasoned T. and G. dressed flooring. When "secret nailed" it presents evenness of texture, colour, and durability not equalled by any other known timber for this purpose (flooring); and doubtless, possessing these merits, would prove acceptable to engineers, architects, contractors, and others if broadly circulated and better known.

Your obedient Servant,
CHARLES DEARDEN, Govt. Timber Inspector.

E. A. Counsel, Esq.,
Surveyor-General and Secretary for Lands, Hobart.

RE TASMANIAN TIMBER FOR BRIDGES, HOUSE-BUILDING, AND OTHER PURPOSES.

CORPORATION OF HOBART.

City Surveyor's Office, Town Hall,
15th January, 1903.

The Master Warden Marine Board, Hobart.

Sir,

Re your inquiries as to the life of Tasmanian Hardwood Timber, I beg to inform you that this class of timber has been in use for bridge work, house-building, and many other purposes, both in the city and outside on the Waterworks, and there are many instances that this timber has been in position for 30 years and over, and still in such cases is practically sound.

I have had a large experience in the use of this timber, and can testify to its advantages when used for timber construction generally.

I am, Sir, yours obediently,
(Sgd.) R. S. MILLES,
City Surveyor.

RE TASMANIAN TIMBERS FOR BENDING AND GENERAL WHEELWRIGHT PURPOSES.

Wood-bending, Nave, and Spoke Works,
Hobart, 17th May, 1905.

Sir,

In compliance with your request, I have pleasure in supplying the following testimony in regard to the use of Tasmanian timbers for bending and general wheelwright purposes, of which I have had experience for over forty years.

BLUE GUM.—This timber I have always used extensively for felloes, spokes, shafts, and general body-work for coach-building and wheelwright purposes, and have found it unsurpassed for such uses, being very dense, tough, and durable. Especial care, however, must be given to the seasoning of the timber, to prevent it cracking or opening by exposure to the sun or wind when freshly cut. I am a thorough believer in the natural process in seasoning, and immediately I receive my supplies from the sawmill, I at once resaw and store away in closed sheds, where all currents of air are excluded as far as possible. Here, a gradual and gentle seasoning is effected. This, say in the case of felloes, would take about two years, but when once the sap is thoroughly extracted, an ideal wheelwright timber is obtained. I have used many timbers, foreign and otherwise, but find the Blue Gum of Tasmania (more especially that from a young tree) equally as good as any timber I know for my purposes.

BLACKWOOD.—This timber is of special value for bending purposes for coachbuilders' and wheelwrights' use. We use it for rims, shafts, poles, rails for carts, pagnals, buggies, and for anything that requires to be bent, and it holds its own with any imported timbers. For bank and other office fittings, Blackwood takes a high place, either in the plain or ornamental work. Some of the wood is very beautifully figured.

It does not require such special care in seasoning as some other woods; that is, it will stand more exposure and does not shrink so much.

MYRTLE.—This is a specially useful timber. It bends fairly well, making good rims, rails, and buggy sides. It is an extremely dense timber, perhaps the most of any Tasmanian timber, and will hold water even in the end way of the grain. I have used it for years in place of Mahogany for T squares, set squares, and drawing requisites; it makes splendid planes, etc. It requires special care in drying, on account of its density, and must not be exposed to wind and weather until properly treated.

I am, yours faithfully,
GEO. DUDLEY.

The Secretary for Lands, Hobart.

RE TASMANIAN TIMBER FOR TRAM-CAR BUILDING.

Hobart, October 4, 1906.

Messrs. Gray Bros., Macquarie-stret, Hobart.
Dear Sirs,

With reference to your verbal inquiry as to our experience of Tasmanian Timber, I am pleased to state that we use the Tasmanian Blackwood almost throughout our car construction, where it has to stand a great variety of stresses and climatical changes, and it has given us every satisfaction. We use the Huon Pine for the panels of the cars, and find it most suitable. We have also used White Gum in the cars, and when procurable in a seasoned condition it is a most useful wood. Of course, we use the Blue Gum and Swamp Gum for our cable poles, and find them satisfactory.

I am, yours faithfully,
C. B. DAVIES,
Electrical Engineer Hobart Tram Company.

RE TASMANIAN TIMBERS FOR CARRIAGE BUILDING, COACHES, AND OTHER VEHICLES.

From VOUT CHISHOLM AND CO. (by appointment to His Excellency the Governor), Carriage Builders, 12 and 14 Argyle-street.

Hobart, 4th October, 1906.

To Messrs. Gray Bros., 83 Macquarie-st., Hobart.
Dear Sirs,

Re your inquiry as to Tasmanian Timbers most suitable for coach-making purposes, we beg to say that the Blue Gum, Swamp Gum, Myrtle, Blackwood, and Huon Pine are woods that compare very favourably with our Oak, Ash, Saugh, Mahogany, or Walnut at home. We feel sure that with the increasing demand for American Hickory, and the great scarcity of same, that there is a good outlook for well selected Tasmanian Timbers for Coach-making purposes.

After twenty-two years of colonial experience, we have had time to fully verify what we have said, and now have pleasure in stating what we use these woods for in our work.

BLUE GUM.—Spokes over $1\frac{3}{8}$in. is quite equal to our oak spokes at home. It is also a splendid wood for felloes for heavy work, some of it being like whalebone.

SWAMP GUM is a very good substitute for Ash or Hickory, having a nice white colour, mellow to work, and very suitable for framing purposes, no one need wish for a better wood for first-class work.

The MYRTLE is good for framing, nice and mild, yet tough. It is also used for rims, and bends well.

The BLACKWOOD is widely used in the colonial trade for panelling, shafts, and rims. For varnished jobs it is a bonnie wood, and with aging increases in beauty. For shafts it is a very good substitute for lancewood, with no treacherous knots in it, as there is in the latter, and for rimming purposes it bends well and wears equal to Hickory. Taking it all round, it is well worth its place in the best of coachmakers' shops.

The HUON PINE, with its nice amber hue, is also a splendid wood for varnished jobs, and puts me in mind of the Scotch Elm bulbs we used for slats of dogcarts, etc., only with this exception, that we can get Huon Pine well figured in boards up to 20ft. x 2ft. 2in., and it is very easily worked, much easier than the Elm. It can also be used (the plain stuff) for all interior linings, and has a very nice odour. No moth or insect goes near the wood, owing to its resinous properties.

Any other information that you may require we will be only too pleased to give, should it lie in our power to do so.

Yours faithfully,
JOHN CHISHOLM,
(for Vout, Chisholm and Co.).

TASMANIAN WOODS FOR FURNITURE, CABINET, AND DECORATIVE WORK.

Elizabeth-street, Hobart,
8th October, 1906.

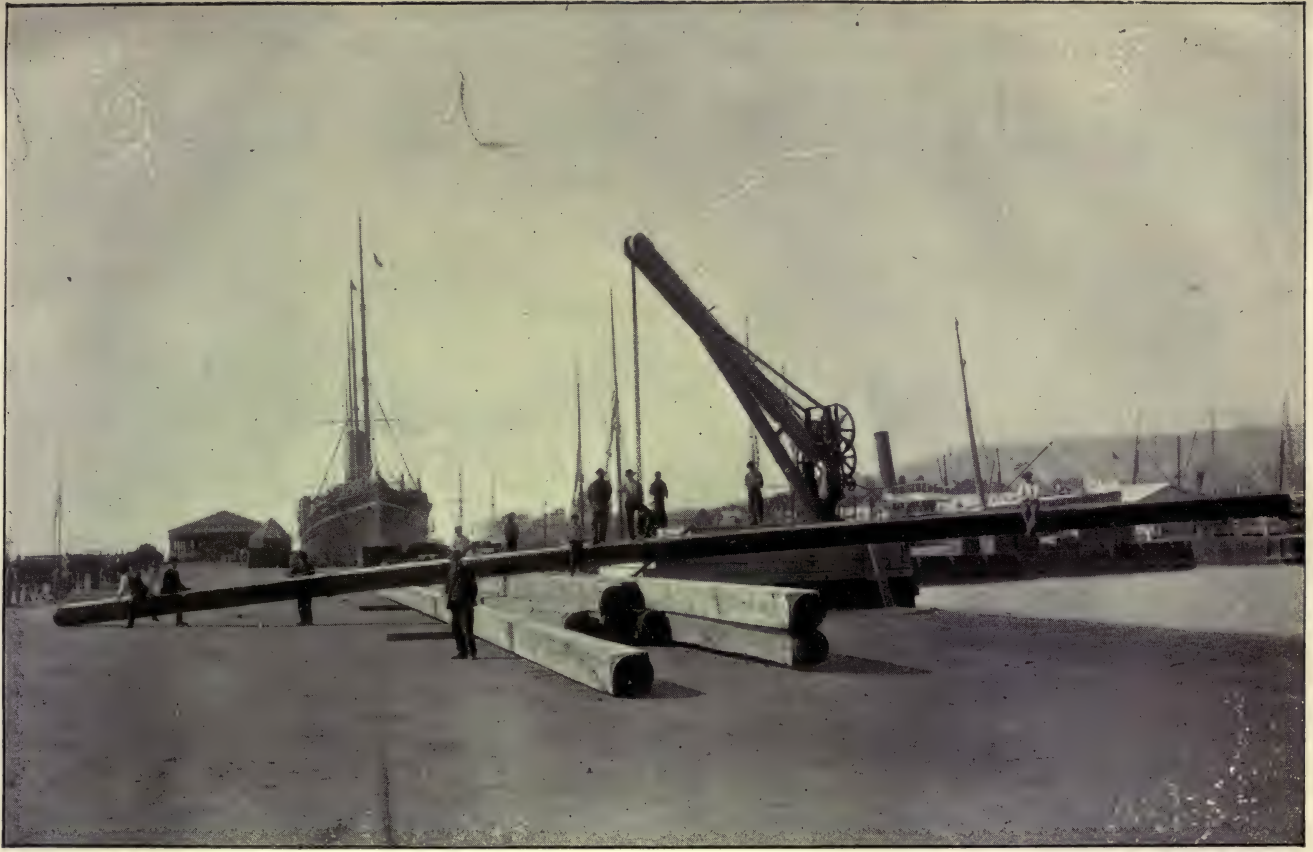
To Messrs. Gray Bros., 83 Macquarie-st., Hobart.

RE THE ORNAMENTAL TIMBER OF TASMANIA.

Dear Sirs,

TASMANIAN BLACKWOOD, which we place first on the list, and from a furniture manufacturer's point of view, is no doubt the finest wood we have in Tasmania for furniture, being very dense, strong, close-grained, and of excellent texture. Although somewhat hard, it works well under tools, when thoroughly seasoned is far superior to American walnut, possessing a reddish-brown colour. against the sombre hue of the Walnut. It is used largely in the turner's lathe for table legs, staircase work, and by carriage builders; in fact, in any particular work blackwood always comes first. There are several kinds, chiefly owing to the different soils it grows in, but it hardly matters what the conditions are, the timber does not lose in quality. The furniture factories in the other States of the Commonwealth envy Tasmania of its beautiful Blackwood. You may go through any of the large furniture shops in Melbourne or Sydney and you will not see the beautiful Blackwood furniture as you will here in Tasmania. It varies in colour, which is very convenient to the cabinetmaker, as you can produce a Walnut, Mahogany, or even a light reddish brown colour—a quality which is seldom found in timber, and a boon to the furniture manufacturer, being able to suit the most fastidious of his customers.

HUON PINE.—This timber is also greatly used in the manufacture of furniture, especially where wide boards are



GRAY BROS.

Shipping Piles at Hobart for Dover (Eng.) Breakwater. Average Length, 100 feet.

required, dispensing with the necessity for jointing. It is one of the most useful of Tasmanian soft woods, superseding all other Pine for general use, where durability and lightness is necessary. Some of the pine is beautifully marked, far surpassing Maple. The shading is of a silvery hue, and the grain more pronounced than Maple. It seasons quickly, and takes a brilliant polish. It is very close-grained, durable, and possesses a resinous quality which resists insects and parasites generally. It has been remarked by English Cabinet-makers that the Tasmanian Blackwood and Huon Pine far exceed any other timber it has been their lot to work.

KING WILLIAM PINE.—The next soft wood of Tasmania is King William Pine, the character of this timber being straight, close-grained, and varies in width from 2ft. to 3ft. It seasons quickly, and resembles more the American or Baltic Pine. It is tough, durable, does not twist or warp, and is excellent in the furniture trade, where wide timber is required, making carcass backs, linings, etc., easy to work, and of a darker colour than Huon Pine.

TASMANIAN OAK is one of the timbers Tasmania boasts most of, on account of its abundance, and the many purposes it is used for, viz., railway sleepers, bridge and wharf building, fencing, building houses, etc.; but, of late years, it has gradually found its way into the cabinet factories. It is dense, tough, straight-grained, and close, and when properly seasoned makes very substantial and durable furniture, takes an excellent polish, and very much resembles the English Oak, more so than any other timber in Tasmania. It certainly lacks the pretty veins which predominate in Oak, but, nevertheless, the variegated markings are even better than Oak—the same in colour. In the course of time Tasmanian Oak will be much more in evidence in the cabinet factories than at present.

MYRTLE is another of Tasmania's beautiful woods, excellent in texture, close-grained, straight, and very durable, pleasant to work, and is a timber the cabinet-maker would choose for ebonising, resembling Pear Tree or Scyamore, but, like many other timbers of Tasmania, is not fostered as it should be. The people of Tasmania seem too apathetic, and the Government do not realise the importance of its resources in this particular industry. To good business men many fortunes could be made by the exportation to different parts of the world of the beautiful cabinet woods of Tasmania.

Yours faithfully,
WILLIAMS BROS.,
Furniture Manufacturers, Hobart.

42-44 Liverpool-street, Hobart.
9th October, 1906.
To Messrs. Gray Bros., 83 Macquarie-st., Hobart.

Dear Sirs,

After upwards of 50 years' experience in the cabinet-making trade, we can speak confidently of the qualities of our most useful woods.

The HUON PINE we find to be the most useful timber for all inside work and linings. It seasons quickly and is easily worked, has a fine, close grain, and is possessed of an aromatic quality which tends to keep away moth and preserves the wood itself. It grows to a large size, and we frequently have logs which cut up 3ft. wide, and even wider. The grain is beautifully clean, and its enduring qualities, even when used for posts let into the ground, is so remarkable that after being in use for 20 years it has been found to be quite sound, and free from rot of any kind. The dry rot does not appear to have any effect on it—in fact, we have never seen it in Huon Pine during all our experience. It polishes beautifully, and in some of its varieties is very choice indeed. What is known as the knotty figured Huon Pine is very much admired, and when made up in panels for furniture has a charming effect. We give it preference to all other woods for inside linings, and workmen prefer to use it before any other.

The CELERY-TOP PINE is another beautiful cabinet timber—much the same as Huon Pine, but seasons even more quickly, and is used also for interiors of furniture. It takes a fine polish, and can be obtained in very long lengths, has a clean, straight grain, and is very easily worked.

The TASMANIAN BLACKWOOD has of late years almost driven cedar out of the market. It is one of the most useful timbers for cabinet purposes, is close in the grain, and in finish very much resembles Walnut. When seasoned thoroughly, it can hardly be beaten by any other wood, and is now used almost exclusively for drawing-room, dining-room, and bedroom furniture. What is known as Fiddle-back Blackwood is one of the most beautiful woods known. It takes a splendid polish, and is highly prized for the manufacture of choice furniture and billiard tables. If care be taken in cutting the trees down at the right time of the year, when the sap is down, the wood can be seasoned within a reasonable time, but if this precaution is not taken, it takes a very long time before the timber is fit for use.

Yours faithfully,
J. WHITESIDES AND SON,
Cabinet-Makers, Hobart.

In a paper, "The Present and Future Prospects of Timber in Tasmania," read by Mr. W. Heyn, of the Timber Department, Admiralty Harbour Works, Dover, England, at a meeting of the Royal Society of Tasmania, Hobart, 29th April, 1901, he states :—

"That he found the Blue Gum Piles easily procured at 100ft. in length, and 18 inches to 20 inches square, admirably adapted for those Harbour works. The specific gravity of Tasmanian Blue Gum, he said, being nearly 75lb. to the cubic foot, renders it unnecessary to weight the piles to get them into position, saving an expenditure of £10 per log, thus supplying all the desiderata required for piling—length, dimensions, solidity, high specific gravity, and, equal to any of these, resisting the sea worm, Teredo Navalis. Blue Gum for its size, strength, and durability, he considers it would be difficult to find any wood superior to it. He added that between the Blue Gum and Stringy Bark there is little to choose, both being excellent, and pointed out that the Tasmanian Stringy Bark is marvellously non-absorbent and resistent of damp, making some of the finest railway sleepers in the world.

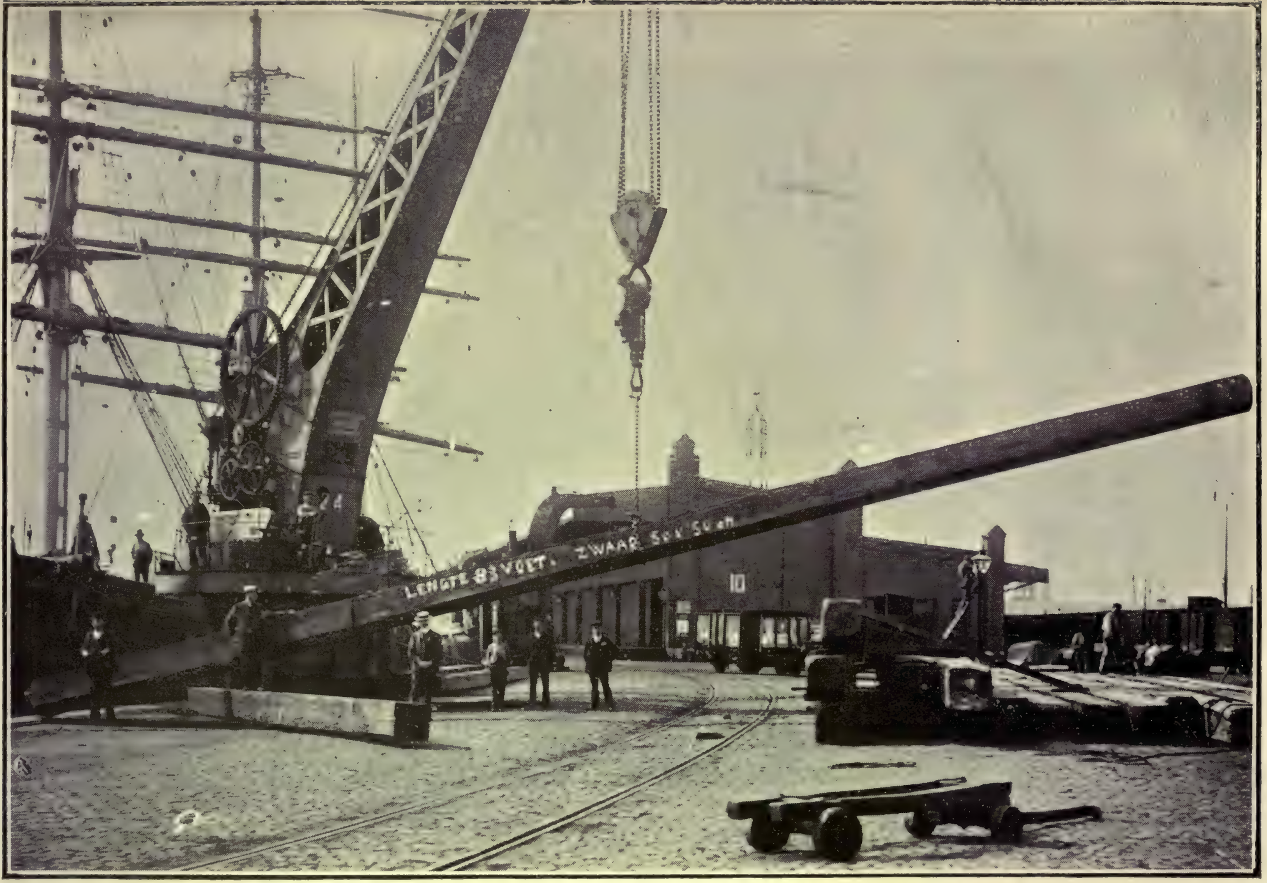
Mr. John Watson, Shipbuilder, of Hobart, states in a paper "On the Strength, Durability, and Value of Blue Gum Timber of Tasmania and of some other Eucalypti for Shipbuilding, etc.," by Mr. James Mitchell, D.A.C.G., read at a meeting of the Royal Society of Van Diemen's Land, Hobart Town, 12th November, 1851 :—

"I have found the Blue Gum equal to English Oak in durability, and superior to it on account of the great lengths that can be obtained. There is no difficulty in procuring lengths of 70 and 80 feet, and if required it could be procured upwards of 100ft. For kelson pieces, lower or upper deck beams, wale-planks and stringers, I consider it to be unrivalled; it takes the steam well, and there is no fear of its spauling in working round a full bow. Fine crooks for rising floors, keel-knees and breast-hooks for the largest ships built could be obtained of this Gum.

"In all my experience in repairs of colonial built vessels, I have never observed any appearance of dry rot. For masts and spars, the Ash Gum is to be preferred, not being so liable to rents as the White, nor is it so heavy as the Blue Gum. The Lightwood is a valuable wood for the finishing work of a vessel, as it will not shrink, and gets very hard when seasoned, although an easy wood to work. It is well adapted for bulwarks, combings, capstans, trussel trees, cheeks and caps for ships of largest dimensions, and for the above purpose I consider it a very durable wood. Fine crooks can be obtained of it.

"The Huon Pine can be used for any purpose about a ship; when seasoned it becomes harder than the Baltic or American Pine. I have never seen an instance of decay in it. It is an excellent wood for boat-building, being much tougher than any other Pine I have seen.

"Myrtle can be procured about 30 feet long, 3 feet diameter, and it is well adapted for blocks and dead eyes."



GRAY BROS.

Discharging Piles at Rotterdam (Holland) from Tasmania.

Tables of Tests
and
Comparative Strengths, etc.

TASMANIAN AND OTHER TIMBERS.

(A. O. Green.)

Arranged in order of stiffness from the deflections of specimens one inch square, supported at ends, span two feet and load one hundred pounds in centre of span.

Name.	W = 100lbs. Deflection inches.	Breaking load. lbs.	Deflections at breaking.
Swamp Gum ... ... dry	·100	555¾	1·1
Stringy Bark ... . "	·115	610¼	1·0
Leatherwood ... ... "	·150	543	1·5
Stringy Bark ... ... fresh cut	·153	341	1·1
Blue Gum ... . dry	·170	560¼	1·1
Oregon Pine ... ... "	·180	379	1·25
Yellow Deal—annual rings vertical* "	·188	353	1·0
Yellow Deal—annual rings horizontal* "	·195	304¾	1·1
Blue Gum ... ... fresh cut	·195	326¼	1·2
Myrtle ... ... dry	·210	491¼	1·4
Ash, English ... ... "	·211†	—	—
Celery-top Pine .. .. "	·238	387¾	1·1
Oak, English ... ... "	·243†	—	—
Beech, English ... ... "	·257†	—	—
King William Pine ... ... "	·655	182	1·655

* Cut side by side from one Deal.

† Calculated from the value of E given in Molesworth's Engineering Pocket Book.

COMPARATIVE TABLE OF WEIGHTS AND TRANSVERSE STRENGTHS OF EUROPEAN AND TASMANIAN TIMBERS.

NAME OF TIMBER.	Lbs. weight per cubic foot.			Transverse strength $\frac{LW}{4b\ d^2}$			EXPERIMENTERS.
	Min.	Max.	Mean of all Tests.	Min.	Max.	Mean of all Tests.	
Ash, English	43	53	47	1471	2445	2130	Barlow, P. W. Barlow, Beaufoy, Denison, Ebbells, Peake and Barrallier, Tredgold, and Rankin.
Beech, English	37	50	43	1557	2031	1794	
Yellow Deal (Sylvestris)	30	44	36	1183	2058	1600	
Oak, English	43	62	54	1092	2892	1788	
Blue Gum, Tasmanian ... fresh cut	60	80	73	1957	2100	2019	Mitchell, Green, Mann.
Blue Gum, Tasmanian .... dry	52	67	60	1867	3361	2706	Mitchell, Laslett, Green.
Stringy Bark ... ... fresh cut	55	75	69	1377	2046	1874	Kernot, Green.
Stringy Bark ... ... dry	48½	66	57	2514	3661	3273	Mitchell, Ransome, Green.
Gum-top Stringy Bark .... ″	48½	51	50	1524	2391	1958	Kernot, Victorian Timber Board, Green.
Swamp Gum ... ... ″	—	—	54	1400	3334	2367	Green.
Peppermint ... ... ″	50	65	59	1599	1646	1623	R. M. Johnston, Green.
White Gum ... ... ″	44	48	46	1646	1788	1717	R. M. Johnston, Green.
Myrtle ... ... ″	39	54	47	2712	2946	2804	Ransome, Green.
Myrtle ... ... fresh cut	—	—	67	—	—	2257	Kernot.
Leatherwood .. .. dry	42	49	45	—	—	3258	Green.
Celery-top Pine ... .. fresh cut	—	—	64	—	—	1378	Kernot.
Celery-top Pine ... ... dry	40	44	42	2124	2326	2225	Kernot, Green.

TASMANIAN TIMBERS.

(A. O. Green.)

Approximate Breaking Weights for Stresses, of Crushing, Shearing, and Tension, in pounds per square inch, from experiments of Professor Kernot, Melbourne University.

		Crushing a'ong the grain.	Crushing across the grain.	Shearing across the grain.	Tension along the grain.	Tension across the grain.
Stringy Bark,	fresh cut	4400	2000	2000	10000	
"	dry*	8000	4500	2000	22000	
Blue Gum,	fresh cut	—	—	—	—	
"	dry*	9000	4500	2000	22000	
Leatherwood,	fresh cut	—	—	—	—	
"	dry*	8000	6000	2000	—	
Myrtle,	fresh cut	5000	—	—	10000	
"	dry*	7000	4500	3000	12000	
Celery-top					—	
Pine	fresh cut	4000	—	—	3000	
"	dry*	7000	1000	1400	12000	

EUROPEAN TIMBERS.

		Crushing along grain.			Tension along grain.			Tension across grain.		
		Min.	Max.	Mean.	Min.	Max.	Mean.	Min.	Max.	Mean.
Ash,	dry	8700	9500	9000	16000	19600	17600	—	—	—
Beech,	"	7700	9500	8500	11000	22000	17000	—	—	—
Oak,	"	6500	10000	8300	9000	20000	13600	—	—	2316
Deal,	"	5500	6500	6000	12000	18000	15400	540	840	626

NOTE.—For purposes of comparison, the "Shearing across the grain" shown for the Tasmanian woods may be taken as equivalent to the "Tension across the grain" shown for European

TESTS MADE IN HOBART, 1902, by A. O. GREEN.

Date cut.	Name of Timber.	Weight per cubic foot.	δ $\frac{WL^3}{4bd^3 E}$ Deflection Load 100 lbs.	W $\frac{4bd^2 S}{L}$ Breaking Weight.	S $\frac{LW}{4bd^2}$ Specific Transverse Strength.	E $\frac{WL^3}{4bd^3 \delta}$ Mean Modulus of Elasticity.	A $\frac{40bd^3 \delta}{Wl^3}$ Constant for Stiffness.	S × Breaking Weight of beam 1ft. × 1in. × 1in. supported at ends and loaded in middle.
		lbs.	inches.	lbs.	lbs.	lbs.		
	TASMANIAN TIMBERS.							
1892	*Eucalyptus obliqua.* Stringy Bark, dry	60·1	·115	610¼	3661	2,988,939	·0058	1220
1900	*Eu. globulus.* Blue Gum, dry	59·2	·170	560¼	3361	2,048,047	·0085	1120
1894	*Eu. Regnans.* Swamp Gum, dry	53·6	·100	555¾	3334	3,423,086	·005	1111
1894	*Eucryphia billardieri.* Leatherwood, dry	48·6	·150	543	3258	2,283,927	·0076	1086
1894	*Fagus Cunninghamii.* Myrtle, dry	54·0	·210	491	2946	1,626,287	·0106	982
1894	*Phyllocladus Rhomboidalis.* Celery-top Pine, dry	40 3	·238	387¾	2326	1,447,775	·0121	775
1902	Stringy Bark, unseasoned	58·8	·155	341	2046	2,263,680	·0076	682
1902	Blue Gum, unseasoned	69·7	·195	326¼	1957	1,759,963	·0098	652
1894	*Athrotaxis Selaginoides.* King William Pine, dry	22·1	·650	182	1092	541,975	·0319	364
	IMPORTED PINES.							
Un-known	*P. Douglassii.* Oregon Pine, dry	34·4	·180	378¾	2273	1,937,728	·0089	758
,,	*P. Sylvestris.* Yellow Deal, Annual Rings vertical*	30·25	·188	353	2118	1,879,417	·0092	706
,	Yellow Deal, Annual Rings horizontal*	31·7	·195	304¾	1828	1,769,037	·0098	609
	ENGLISH TIMBER. †							
	Fraxinus Excelsior. Ash, English, dry	47·	·211	333	2000	1,640,000	·01	666
	Fagus Sylvatica. Beech, English, dry	43·	·257	333	2000	1,345,000	·013	666
	Quercus Vars. Oak, English, Dry	58·	·243	282	1690	1,420,000	·013	563

* Both cut from same deal.

† Highest values for English Timbers from Molesworth's Engineering Pocket Book.

TABLE OF TESTS MADE BY JAMES MITCHELL, D.A.C.G., ON TASMANIAN TIMBERS.

No. of Experiment.	NAME OF WOOD, ETC.	Specific Gravity.	Greatest Weight and Deflection while the Elasticity was perfect.		W	Δ	D	U	E	S	S	C	Direct Cohesion on square inch from experiment.
			Weight lb. W^1	Deflection inches d	Breaking Weight. lbs.	Ultimate Deflection. inches.	Depth of Neutral Axis.	Value of Ultimate Deflection.	Value of Elasticity. $L = \frac{l^2 w^1}{a d^3 d}$	Value of Strength. $S = \frac{lw}{4ad^2}$	Value of Strength. $S' = \frac{lw \sec^2 \Delta}{4ad^2}$	Value of Direct Cohesion. $C = \frac{S' d^2}{(D-d^2)}$	lbs.
	1. BLUE GUM, 7ft. long, 2in. square.												
1	Green piece, newly cut	1027	349	2·125	755	8·5	1·25	415	6083932	1982	2063	14670	11232
2	Ditto	1078	299	1·125	800	7·75	—	457	9845472	2100	2135	—	18480
3	Piece seasoned about 3 years	1003	315	1·875	695	6·75	—	423	6022637	1693	1737	—	—
4	Ditto 8 months	1076	294	1·5	819	7·5	—	—	7260624	2149	2211	—	13104
5	Ditto	1034	503	1·375	867	5·	1·25	705	13551368	2276	2291	16291	93408
6	Ditto from 2 to 3 years	1054	472	1·375	1029	6·5	1·25	542	13625285	2701	2766	19669	28784
7	Ditto 4 to 5 years	1078	413	1·375	1043	6·	1·25	588	11126670	2737	2793	19861	27440
8	Ditto 2 to 3 years	987	567	1·75	1113	7·5	1·1875	470	12180827	2921	3015	18268	22064
9	Ditto 4 to 6 years	1071	434	1·375	1113	6·	1·1875	588	11692438	2921	2981	18063	27472
10	Ditto 3 years	942	496	1·625	1122	5·25	1·125	784	14271872	2945	2996	15612	31088
11	Ditto, yellow coloured	1018	623	2·625	1131	7·5	—	470	8791776	2969	3064	—	20168
12	Ditto, brown coloured	997	679	1·625	1140	5·25	1·375	672	15478693	2992	3039	31119	27888
13	Ditto, curly Gum	1005	776	1·75	1235	6·	—	588	16426368	3242	3305	—	31024
14	Ditto, brown coloured	1008	654	1·625	1282	5·	1·1	705	14908785	3365	3389	16735	35920
15	Ditto	1089	518	1·625	1330	4·	—	882	13955485	3491	3522	—	28336
	Separate Experiment.												
16	Piece of keel from a steamer, 5ft. long, 1¾in. square	1090	—	—	791	3·5	—	587	—	2213	2243	—	26288
	Weight reduced to 7ft. long, and 2in. square	—	—	—	842	—	—	—	—	2210	—	—	—
	2. ASH, OR SWAMP GUM.												
1	Green piece, 7ft. and 2in. square	967	310	1.5	688	6·25	—	564	7655760	1806	1846	—	18480
2	Ditto	1003	434	1·75	750	5·5	1·25	641	9186412	1968	2022	14378	18496
3	Seasoned Piece, ditto	954	354	1·25	914	6·	—	588	10490860	2399	2148	—	16888
	3. STRINGY BARK.												
1	Green piece, brown coloured	919	326	1·25	707	5·	—	705	9661075	1856	1882	—	21376
2	Ditto, reversed grain	919	314	1·5	736	5·75	—	613	9305452	1932	1968	—	21376
3	Ditto, white coloured	798	357	1·75	746	6·5	1·125	642	7556976	1958	2005	10487	20845
4	Ditto	866	440	1·75	746	5·25	—	672	9315920	1958	1995	—	23290 18400
5	Seasoned upwards of 6 years	925	417	1·625	973	4·25	1·	830	9506060	2554	2584	10336	20968
6	Ditto 15 years	864	552	2·5	972	5·5	1·125	672	12583561	2551	2599	13578	12500
7	Ditto 18 years	947	468	1·25	958	2·75	—	1283	13869273	2514	2525	—	18138
8	Ditto 20 years	847	427	1·625	977	5·75	1·1875	613	9927863	2564	2613	15832	27440
9	Ditto	838	451	1·625	990	5·25	—	672	10781134	2598	2647	—	27440

In the Table { l signifies the length, a the breadth, d the depth, Δ the deflection. S the value of the strength, without considering the deflection.
W the weight, C the cohesion, D the depth of the neutral axis. S′ the value of the strength, the deflection considered.

The depth of the neutral axis is not given in many of the experiments, it being found impracticable to ascertain it with nicety, from the irregular nature of the fractures; these, however, always evinced compression and tension clearly enough, whether the pieces were broken short off or rent along the grain, which sometimes, though rarely, occurred

The direct cohesion, by experiment, is given in each case, as preferable to that shown by the formula, the applicability of which, without reference, to the discrepancies between the results, is, I think, questionable.

SUNDRY WEIGHTS OF ROUND, SPLIT, AND SAWN TIMBER.—(A. O. Green.)

Blue Gum Piles at 75lbs. a cubic foot.

Diameter in feet and inches—	1′ 0″	1′ 4″	1′ 8″	2′ 0″	2′ 6″	3′ 0″	4′ 0″
Weight per foot run of pile in pounds ... ...About	59	104	163	236	368	530	942
Number of running feet to a ton... ... ...About	38	21½	13¾	9½	6	4½	2⅓

Stringy bark piles weigh about 69 lbs. a cubic foot, or say 10 per cent. less than blue gum.

Other Tasmanian woods weigh from 55 lbs. to 70 lbs. a cubic foot in the log.

One foot super. or board measure of hardwood, fresh cut, weighs 5¾ lbs. to 6 lbs.

8⅓ cubic feet or 100 feet super. of fresh cut stringy bark weighs about 560 lbs.
8⅓ " 100 " dry stringy bark " 450 lbs.
8⅓ " 100 " imported deal " 373 lbs.

THE FOLLOWING QUANTITIES WEIGH ABOUT A TON.

Timber.

Cubic feet. Super feet.
33· or 400 of hardwood is usually considered a ton = 68 lbs. a cubic foot.
32·6 or 390 of fresh cut stringy bark = 68·7 lbs. a cubic foot.
30· or 360 of fresh cut blue gum = 74· " "
32· or 384 of fresh cut blackwood = 70· " "
50· or 600 of imported pine or deal is usually considered a ton = 45 lbs. a cubic foot.
66· or 792 of deal dry enough for use is considered by English builders a ton = 34 lbs. a cubic foot.
60· to 72· or 840-864 of deal thoroughly dry weighs a ton = 30 to 32 lbs. a cubic foot.
600 feet super. stringy bark (green), or 1 load of 50 cubic feet = 30 cwt. dead weight.
600 feet super. blue gum (green), or 1 load of 50 cubic feet = 33 cwt. dead weight.

Sleepers.

No. to a ton.			Cubic feet.
12·34	blue gum sleepers,	7′ × 10″ × 5″.	1 sleeper = 2·4305, and weighs 182 lbs.
13·3	stringy bark sleepers,	7′ × 10″ × 5″.	1 sleeper = 2·4305, and weighs 168 lbs.
14·7	blue gum sleepers,	6′ 6″ × 9″ × 5″.	1 sleeper = 2·031, and weighs 152 lbs.
16·	stringy bark sleepers,	6′ 6″ × 9″ × 5″.	1 sleeper = 2·031, and weighs 140 lbs.

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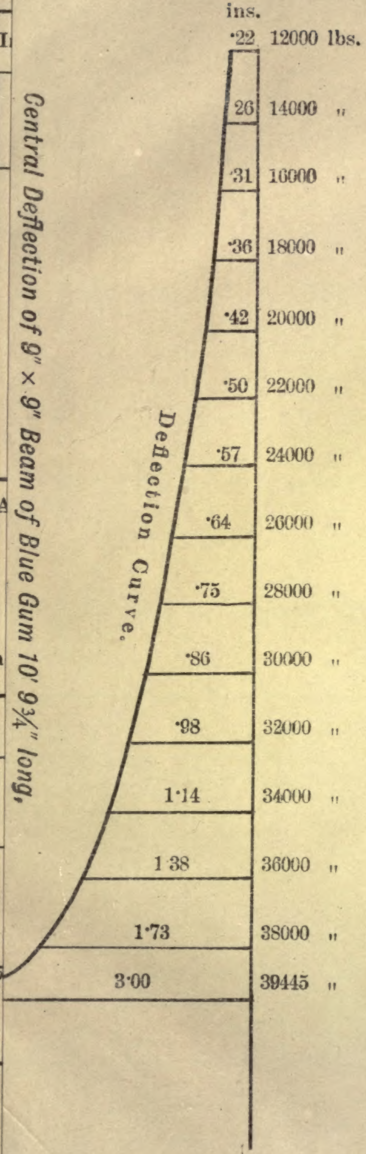

Central Deflection of 9″ × 9″ Beam of Blue Gum 10′ 9¾″ long,

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